



Site Management Plan

(Tier 2, Low Risk)

WDID- 1_12CC404376

**Humboldt County
APN: 210-071-013-000**

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TRC 416

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Purpose

This Site Management Plan (SMP) has been prepared on behalf of the cannabis cultivator for the Humboldt County property identified as assessor parcel numbers 210-071-013-000, by agreement and in response to the State Water Resources Control Board Cannabis Cultivation Policy (Cannabis Policy), in congruence with Order WQ 2017-0023-DWQ General Waste Discharge Requirements for Discharges of Waste Associated with Cannabis Cultivation Activities (General Order). The General Order implements the Cannabis Policy requirements, specifically those requirements that address waste discharges associated with cannabis cultivation activities. Cannabis cultivators covered under the General Order are subject to the requirements of the Cannabis Policy in its entirety. The Cannabis Policy provides a statewide tiered approach for permitting discharges and threatened discharges of waste from cannabis cultivation and associated activities, establishes a personal use exemption standard, and provides conditional exemption criteria for activities with a low threat to water quality.

Tier Designation

Tiers are defined by the amount of disturbed area. Tier 1 outdoor commercial cultivation activities disturb an area equal to or greater than 2,000 square feet and less than 1 acre (43,560 square feet). Tier 2 outdoor commercial cultivation activities disturb an area equal to or greater than 1 acre. Risk designation for Tier 1 and Tier 2 enrollees under the Cannabis Policy is based on the slope of disturbed areas and the proximity to a surface water body. Characterization is based on the risk designation summarized in Table 1 below.

Table 1: Summary of Risk Designation

Low Risk	Moderate Risk	High Risk
<ul style="list-style-type: none"> • No portion of the disturbed area is located on a slope greater than 30 percent, and • All of the disturbed area complies with the setback requirements. 	<ul style="list-style-type: none"> • Any portion of the disturbed area is located on a slope greater than 30 percent, and • All of the disturbed area complies with the setback requirements. 	<ul style="list-style-type: none"> • Any portion of the disturbed area is located within the setback requirements.

Thorough assessment of the project area including roads, disturbed areas, legacy features, and cultivation areas classify this enrollment into the **Tier 2, Low Risk** designation.

Scope of Report

Tier 1 and Tier 2 cannabis cultivators are required to submit and implement a Site Management Plan that describes how they are complying with the Requirements listed in Attachment A. The description shall describe how all applicable Best Practicable Treatment or Control (BPTC) measures are implemented. Cannabis cultivators within the North Coast Regional Water Quality Control Board jurisdiction are required to submit and implement Site Management Plans that describe how the Requirements are implemented property-wide, to include legacy activities. The SMP includes an Implementation Schedule to achieve compliance, but all work must be completed by the onset of the Winter Period each year. Projects designated as Moderate Risk are also required to have a Site Erosion and Sediment Control (plan) to achieve the goal of minimizing the discharge of sediment off-site. Projects designated as High Risk are also required to have a Disturbed Area Stabilization Plan to achieve the goal of stabilizing the disturbed area to minimize the discharge of sediment off-site and comply with the setback requirements. The cannabis cultivator shall ensure that all site operating personnel are familiar with the contents of the General Order and all technical reports prepared for the property. Projects which have over one acre of cannabis cultivation (total canopy area) are also required to have a Nitrogen Management Plan to describe how nitrogen is stored, used, and applied to crops in a way that is protective of water quality. A copy of the General Order, and technical reports required by the General Order, shall be kept at the cultivation site. Electronic copies of these documents are acceptable. Either format of maintained documents kept on site must be immediately presentable upon request.

Methods

The methods used to develop this SMP include both field and office components. The office component consisted of aerial photography review and interpretation, existing USGS quad map review, GIS mapping of field data, review of on-site photography points, streamflow calculations, general planning, and information gathered from the cannabis cultivator and/or landowner. The field component included mapping of all access roads, vehicle parking areas, Waters of the State, stream crossings, drainage features, cultivation sites, buildings, disturbed areas, and all other relevant site features within the project area and surrounding areas (as feasible). Cultivation areas, associated facilities, roads, and other developed and/or disturbed areas were assessed for discharges and related controllable water quality factors from the activities listed in the General Order. The field assessment also included an evaluation and determination of compliance with all applicable BPTC's per Section 2 of the General Order.

Property Description

The property assessed is a single parcel totaling 45 acres, and is located approximately 5.6 miles southeast of Bridgeville, California, at an elevation of approximately 2,800' – 3,200' above mean sea level. The property is located in Section 26, T1N, R4E, HB&M, Humboldt County, of the Larabee Valley USGS 7.5' Quad. A number of unnamed class III watercourses flow through the property, all of which join Mule Creek, which flows west-east through the property, which is tributary to Butte Creek, Little Van Duzen River.

Site Management Plan

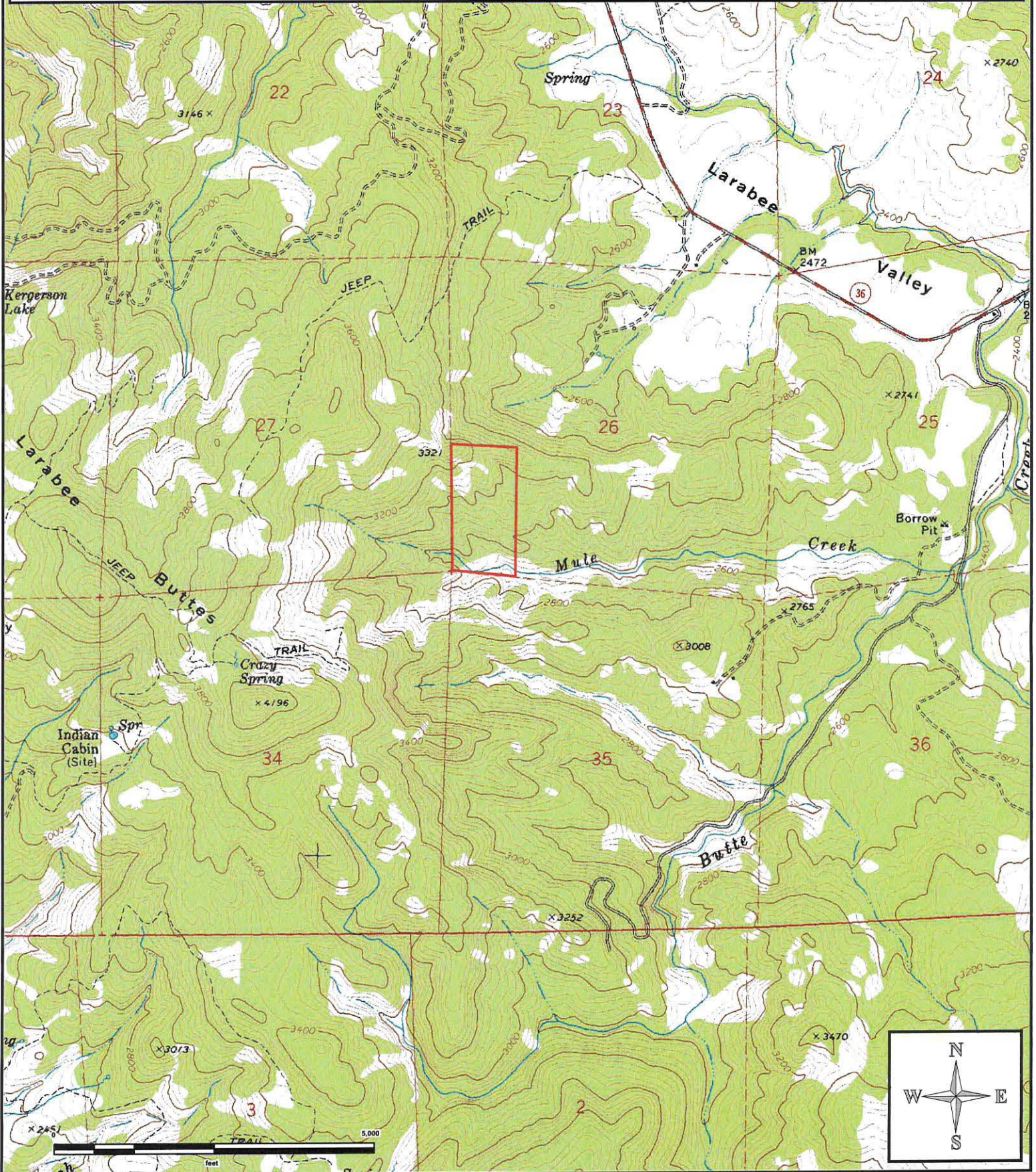
General Location Map [WDID - 1_12CC404376]



 Property Boundary

Located in Section 26, T1N, R4E, HB&M, Humboldt County, of the Larabee Valley 7.5' USGS Quad Map

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Project Description

Cannabis cultivation on the property consists of nine greenhouses of varying dimensions. Cultivation techniques used on the property include light deprivation, mixed-light cultivation, as well as outdoor cultivation, for a total general cultivation area¹ of 35,503 ft². The cultivation areas are located within 65,871 ft² of disturbed area. The cultivation areas are not located greater than 200' from surface waters, although they do comply with surface water setbacks. This project is being permitted by Humboldt County to cultivate cannabis. This project was previously enrolled in the North Coast Regional Water Quality Control Board Order No. R1-2015-0023 and has since enrolled with State Water Resources Control Board as WDID-1_12CC404376. This project is being classified as Tier 2, Low Risk.

Table 1: Cultivation Site Parameters.

Cultivation Area	Land Disturbance Area (ft ²)	General Cultivation Area ¹ (ft ²)	Adjoining Hillslopes (% Grade)
A	52,161	5,396	26
B	Included Above	5,939	26
C	Included Above	17,121	26
D	10,780	5,964	18
E	2,930	1,083	18
Totals:	65,871	35,503	

Table 2: Project Permitting

Additional Required Permits Related to Project, Type, and Status	
SIUR	Small Irrigation and Use Registration-Filed with Division of Water Rights #H502515
LSA-1600	Submitted

¹ General cultivation area refers to definable areas or groupings of closely situated cannabis cultivation. This designation does not, in any way, reflect the actual cannabis canopy area permitted or present during the assessment of the project area.

Baseline Assessment of Requirements Related to Water Diversions and Waste Discharge for Cannabis Cultivation

This project was previously enrolled in the North Coast Regional Water Quality Control Board Order No. 2015-0023. A Water Resource Protection Plan (WRPP) was prepared by Pacific Watershed Associates. A re-assessment of the project was conducted and will be used as the baseline assessment for the preparation of this document.

Land Development and Maintenance, Erosion Control, and Drainage Features

Project Compliance Y/N

Roads are being classified as “permanent” (roads appurtenant to the project being used year-round), “seasonal” (roads appurtenant to the project being used primarily during summer months), “legacy” (roads not appurtenant to the project receiving little to no use), and “trail” (being rarely used for occasional access to features on the property).

Roads within the project area appear to have a moderate native rock component and, based on observations of surface erosion relative to current surface drainage break frequency, are being classified as having low erodibility. This classification will be utilized to determine surface/ditch-line drainage break frequency based on Table 19 of the Handbook for Forest Ranch and Rural Roads, 2014.

TABLE 19. Recommended maximum rolling dip and ditch relief culvert spacing, in feet, based on road gradient and soil erodibility ^{1,2}

Soil erodibility	Road gradient (%) and drainage structure spacing (feet)				
	0-3	4-6	7-9	10-12	>12
High to moderate	250	160	130	115	100
Low	400	300	250	200	160

Currently, all roads on the property have native surfaces. Roads being classified as permanent shall be appropriately surfaced (crushed rock, lignin treatments, pavement, or chip-seal) to increase durability during winter use. The parking and turnaround areas near living structures and buildings at the southern end of the property will be rock surfaced as they are located within the riparian setbacks.

Overall, the roads present on this property were observed to be well-drained, with little to no signs of erosion. The main permanent access road which allows property access was observed as having gulying near Sites 01 & 06. Wheel ruts were also observed on the upper ATV trail at Site 17. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

A number of sites were observed to be experiencing significant erosion around cultivation areas. Site 22, north of Cultivation A, was observed to be experiencing the most notable erosion on the property. The cutbank at this Site has eroded and deposited fill that has reached half-way through a greenhouse. This slump was not exacerbated by upslope drainage features in any way but was

the result of overly steep cut-slopes. Site 19 identifies a cutbank slump just south of Site 22 which has resulted in a near vertical pitch above the greenhouse. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

A number of Controllable Sediment Delivery Sites (CSDS's) were observed during the assessment of the property. The fill slope of the western edge of the graded flat on which Cultivation Area B is located was observed to be eroding downslope toward the unnamed Class III watercourse below. It is unknown if this site is currently delivering, however, due to its proximity to the watercourse, erosion control and soil stabilization measures will be prescribed to prevent the possibility of delivery. The storage of fertilizers and exposed soil cubes within the riparian setback were observed and identified as Site 03. The soil was observed to be delivering a significant amount of sediment into the Class II Mule Creek below. The ford crossing identified as Site 15 was also observed to be a CSDS due to erosion and delivery from the left road approach. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

No unstable areas were observed during the assessment of the property.

Cleanup, Restoration, and Mitigation:

Project Compliance Y/N

Inorganic waste was observed throughout the property, most notably on the graded flats holding the cultivation areas, and over the outboard edges of these flats. Due to the proximity of watercourses downslope of these flats, these wastes have a potential to be transported by wind or rain into Waters of the State. Site 16 identifies hardened concrete which was poured down the outboard edge of a permanent road. The cement dried roughly 5' feet away from the Class III watercourse. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

Stream Crossing Installation and Maintenance:

Project Compliance Y/N

Three watercourse crossings were observed during the site assessment. Sites 04, 05, & 15 identify watercourse crossings located on the property. Site 04 identifies a permanent, double-wide railcar bridge which is approximately 40' long and 15' wide. The bridge is located roughly 10-12' over the watercourse, and is appropriately sized for a 100-year peak streamflow scenario. Site 05 identifies a 60" diameter permanent culverted watercourse crossing over a Class III watercourse. The crossing is properly installed and sized for a 100-year peak streamflow scenario. Site 15 identifies a ford watercourse crossing of a Class III over an unused ATV trail. The northern approach is steep, lacks water-breaks, and was found to be contributing sediment to the Class III watercourse. The crossing located at this site is to be decommissioned. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

Table 3a: Stream Crossing Hydrology of Existing Structures

Rational Method for 100-year flood flow (A < 200 acres) Hum 210-071-013 LSA

$T_c = 60((11.9 \times L^3)/H)^{0.385}$					$Q_{100} = CIA$				
No.	Crossing	Channel length (to top of basin) (mi) L	Elevation difference (ft) H	Concentration time (min) Tc	Runoff coefficient C	100-year Return-Period Precipitation (in/hr) I*	Area (acres) A	100-yr flood flow (cfs) Q100	Magni
###									NC
###	2	1.05	1360	15	0.35	3.12	302	329.8	NE
###	3	0.543	960	10	0.35	3.86	45	60.8	CC

HW/D	CU18	CU24	CU30	CU36	CU42	CU48	CU54	CU60	CU72	CU84	CU96
0.67	4.4	9.1	16	25.2	37.2	52.3	70.5	90.9	142	209.6	296.2
1.0	5.6	11.6	20	32	47	66	89	115	180	265	375
1.1	6.4	13	23	35	53	75	99	128	200	300	425
1.2	7	14.5	25	40	59	83	109	141	230	330	475
1.3	7.9	16.5	28	44	64	90	120	158	250	370	520
1.4	8.2	16.7	30	46	68	96	125	165	260	390	545

The above table is taken directly from an existing 1600 which sized the existing culvert and bridge for a 100-year peak streamflow scenario. Crossing 2 refers to Site 04, and crossing 3 refers to Site 05.

During the assessment of the property, a Class III watercourse was observed to be intersecting the permanent access road into the property. Water was observed to be flowing downslope from the southeastern portion of the property where it met the permanent road and flowed down the inboard edge of the road to the Class II Mule Creek below. The below tables represent the minimum culvert diameter sizing required to adequately pass storm water from a 100-year peak streamflow scenario. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

Table 4b: Stream Crossing Hydrology of to-be Installed Structures

Watershed Point Input Values						
ID_NUMBER	(ac) D_AREA	(ft) K_VALUE	(ft) ELEV_D	(mi) LENGTH	(in) CMP_DIA	
Site 02	6	0.35	0	0.0	0	0

100-Year Storm		
Time, Min.	Depth (in)	Inch/hr.
10	0.917	5.50
15	0.965	3.86
30	0.951	1.90
60	1.059	1.06
90	1.700	1.13
120	2.218	1.11
150	3.534	1.41
180	5.258	1.75
1440	7.558	0.31

ID#	Runoff	Altitude	Time of	24-hr. Rainfall	Mean	Drainage	Selected	Q 100	
	Coef. (K)	Index (1000's ft.)	Concen. (min)	Intensity (in/hr)	Annual Rainfall (in)	Area (ac)	Discharge Method	RATIONAL (cfs)	USGS MF (cfs)
Site 02	0.35	0.0	0	5.50	51	6	RATIONAL	12	8

ID#	Existing	Headwall	Selected	Culvert		Recommended		
	Culvert (D) Diameter (in)	(HW) Height (in)	HW/D (ratio) Method	Discharge Q100 (cfs)	Capacity (cfs)	Culvert is Undersized	Culvert Dia. (in)	Recommendation Based On
Site 02	0	0	0.0 RATIONAL	12	0	TRUE	30	Q100

Soil Disposal and Spoils Management:

Project Compliance Y /N

Currently, no spoils are present on the property. Any/all spoils generated through development or maintenance of roads, driveways, earthen fill pads, or other cleared or filled areas have not been sidecast in any location where they can enter or be transported to surface waters. Any/all future spoils generated as a result of any future construction projects that are to be stored on the property shall be done so in accordance with the BTPC.

Riparian and Wetland Protection and Management:

Project Compliance Y /N

Nine sites were observed to be threats to riparian and wetland protection. These include Sites 03, 07, 08, 09, 11, 12, 13, 16, & 23. These sites include fertilizers, soil, soil cubes, fuel tanks (transfer and permanent tanks), a burn pile, generator, and side-cast concrete which are located within the riparian setbacks. Nearly the entire residential parking area is within the riparian setback, requiring a number of storage sites to be moved. Due to the proximity to the Class II Mule creek below, the parking area and all areas of vehicular use will be rock surfaced. These sites pose a direct threat to water quality and downstream wildlife habitat. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

Table 4: Riparian and Wetland Protection and Management

Disturbed Area	Disturbance Area Distances and Riparian Setbacks ²				
	Class I [Setback: 100'] ²	Class II [Setback: 100']	Class III [Setback: 50']	Perennial Spring or Wetland [Setback: 50'] ²	Cultivation-Related Disturbed Areas Within Setbacks [ft ²]
Cultivation Area A	>200'	>200'	74	>200'	0
Cultivation Area B	>200'	>200'	87	>200'	0
Cultivation Area C	>200'	>200'	103	>200'	0
Cultivation Area D	>200'	>200'	76	>200'	0
Cultivation Area E	>200'	>200'	83	>200'	0
Total =					0

²This enrollment was previously enrolled in RWQCB Order No 2015-0023 and as such may retain reduced setbacks that were applicable under the previous Order.

Water Storage and Use:

Project Compliance Y /N

All water on the property is derived from a permitted well (Well 01), and point of diversion (POD) located on the property. There is a second well (Well 02) located on the property which the Cultivator says is no longer in use. Well 01 is a 320' deep groundwater well. It can deliver up to 4 gallons per minute, and 2,500 gallons per day. The POD on the property is used to top off water storage tanks outside of the forbearance period. Well 01 meets and exceeds the required water demands for agricultural use. At present there are no metering devices in place to record water usage associated with the irrigation of cannabis. A metering device shall be installed in 2019 to meter all water used for the irrigation of cannabis. Monthly water usage shall be recorded for annual reporting purposes.

Water is stored in hard plastic storage tanks ranging from 1,500, to 5,000 gallons. Multiple water storage tanks were found to have lids not in place to prevent access and entrapment of wildlife. Tank lids shall be kept closed at all times when access is not needed. Tanks that do not utilize lids shall be retrofitted to be enclosed from wildlife. Overflow prevention measures shall be installed on diversion infrastructure or water storage tanks to prevent the overflowing of tanks and unnecessary diversion of water resources when water storage infrastructure has filled. Drip line irrigation is currently in use at this property, however, further water conservation measures such as morning or evening watering, and mulch or cover cropping of cultivated top soils shall also be implemented.

At this time the Cultivator has 86,200 gallons of water storage installed. Based on the production rate of the well, this volume of storage is sufficient to allow for full forbearance during the required period from April 1st to October 31st. Based on water use estimates, the Cultivator is not required to install additional storage prior to the Forbearance Period for 2020. Recorded water use data shall be used to determine remaining, or exact, storage needs to meet full forbearance. Less water

storage may be sufficient if recorded water usage numbers determine that actual water use is less than estimates. Monthly water usage estimates and the season total are as follows below.

Table 5: Estimated Annual Water Use

	Jan	Feb	March	April (25%)	May (60%)	Jun (80%)	Jul (100%)	Aug (100%)	Sep (70%)	Oct (20%)	Nov	Dec
Agriculture				14,171	32,913	43,884	54,855	54,855	38,399	10,971		
Sq. ft. =	% = percent of peak usage											
26,400												Total AG Water Use = 250,047

There is domestic water use at this time, on this property. Water meter(s) and water supply infrastructure shall be designed/installed in a manner such that water usage for the irrigation of cannabis can be recorded separately from water used for domestic use. Additionally, if there are multiple diversions of surface water, infrastructure/metering device(s) shall be designed/installed in a manner that each source of surface water is recorded separately.

During visits to the property, no irrigation runoff, or evidence of such runoff, was observed at any of the cultivation areas.

Fertilizers, Pesticides, and Petroleum Products:

Project Compliance Y /N

Fertilizers, potting soils, compost, and other soils and soil amendments are currently stored in ways and locations which present the possibility for delivery to Waters of the State. A number of storage sites were determined to be within the riparian setbacks of the Class II Mule Creek, which requires relocation.

Currently, bulk fuel storage on the property is located at Sites 10, 11, & 12. Fuel storage includes an exposed oil drum, hand cans, and two 550-gallon tanks containing red diesel. The majority of the structures containing these storage tanks were found to be inadequate to prevent spills or leaks in the case of a container failure. Any/all fuel canisters and motor oil containers shall be stored in secondary containment (e.g. plastic totes or sealed metal boxes) while being stored long term or not in immediate use, wherever these materials are used anywhere on the property. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

Any/all future petroleum products and other liquid chemicals, including but not limited to diesel, biodiesel, gasoline, and oils shall be stored so as to prevent their spillage, discharge, or seepage into receiving waters. Storage tanks and containers shall be of suitable material and construction to be compatible with the substance(s) stored and conditions of storage such as pressure and temperature. Above ground storage tanks and containers shall be provided with a secondary means of containment for the entire capacity of the largest single container and sufficient cover shall be provided to prevent any/all precipitation from entering said secondary containment vessel. Cannabis cultivators shall ensure that diked areas are sufficiently impervious to contain discharged

chemicals. Cannabis cultivators shall implement spill prevention, control, and countermeasures (SPCC) and have appropriate cleanup materials available onsite if the volume of a fuel container is greater than 1,320 gallons. Underground storage tanks 110 gallons and larger shall be registered with the appropriate County department and comply with state and local requirements for leak detection, spill overflow, corrosion protection, and insurance coverage. On site storage of petroleum products, or other fuels used for commercial activities may require registration as hazardous materials through the California Environmental Reporting System (CERS). Additionally, any waste oil generated from commercial activities (generators) is considered by the state hazardous waste and requires additional reporting. This cannabis cultivator is advised to contact local agencies to find out if such reporting is applicable to currently operations.

Cultivation-Related Wastes:

Project Compliance Y /N

Four cultivation-related waste sites were located throughout the property, and are identified as Sites 03, 23, 09, & 13. These sites include fertilizers, potting soil, and soil cubes. Cultivation-related wastes are allowed to be stored on the property, but must be stored in a fashion where they cannot enter or be blown into surface waters, or in a manner that could result in residues and pollutants within such materials to migrate or leach into surface water or groundwaters. Cultivation-related wastes are also required to be stored outside of all riparian setbacks. See the Mitigation Report, Treatment Implementation Schedule, and Site Map to follow for site specific details.

Monofilament (e.g. plastic trellis netting and fencing) was observed on the property during the assessment. All monofilament netting or fencing is banned for future use. All existing monofilament netting shall be collected, secured with other refuse, and disposed of properly at a waste disposal facility.

Organic cultivation-related wastes are collected from the cultivation areas and either disposed of properly with general waste, or composted or burned. The cannabis cultivator shall ensure that the locations where organic wastes are stored, composted, or burned are minimized in number and are sited outside of watercourse riparian areas and away from any form of surface runoff.

Non-organic cultivation-related wastes are stored in lidded trashcans and garbage bags adjacent to or in the residence, sheds, and cultivation areas and are disposed of regularly at a solid waste transfer station. The cannabis cultivator shall continue to gather and properly dispose of cultivation-related wastes and ensure that wastes are adequately contained from scavenging wildlife, and cannot be transported away from storage areas by wind or surface runoff.

Refuse and Domestic Waste:Project Compliance Y /N

Garbage and refuse are stored on the property within lidded trash cans and garbage bags and are disposed of regularly at the nearest solid waste transfer station. The Cultivator shall continue to gather and properly dispose of refuse and ensure that refuse is adequately contained from scavenging wildlife, and cannot be transported away from storage areas by wind or surface runoff.

Human waste is managed by a Six Rivers portable toilet, identified as Site 14. It is the cannabis cultivator's responsibility to ensure compliance of such action with the Humboldt County Department of Environmental Health and Human Services.

Annual Winterization Measures

Winterization measures consist of general cleanup and winter-preparation activities that both prepare for, and utilize, anticipated, local winter weather. In project areas that may become inaccessible during periods, or the entirety, of the winter, additional winterization procedures and precautions may be required due to the potential absence of winter monitoring.

- Any exposed soils resulting from winterization activities shall be seeded and straw mulched.
- Any/all areas of exposed soils in and around cultivation areas shall be seeded and straw mulched.
- All existing culvert inlets, interiors, and outlets shall be cleared of any existing or potential obstructions to include; debris upstream of the culvert such as sediment, loose, moveable rocks, and raftable, small, woody debris.
- Damage or wear resulting from vehicular use to road surfaces (such as rutting or wheel tracks) and/or road surfacing (such as rock) that would impair road surface drainage or drainage features (such as outsloping, waterbars, rolling dips, etc.) shall be repaired prior to the Winter Period.
- All existing surface drainage features and sediment capture features shall be maintained if needed to ensure continued function through the Winter Period.
- All soils, fertilizers, and petroleum products will be stored in an area located outside of riparian setbacks, completely sealed, placed in a secondary containment (liquids), and stored in a manner that prevents contact with precipitation and surface runoff.
- Chemical toilets will be removed from the property until need resumes the following cultivation season, or at a minimum serviced and left unused during periods when not in use.
- Water storage tank lids shall be appropriately closed to prevent the access of wildlife.
- All refuse/trash shall be removed and disposed of appropriately.
- All inorganic material capable of being transported by wind or rain shall be secured and stored appropriately.

STATEMENT OF CONTINGENT AND LIMITING CONDITIONS CONCERNING THE PREPARATION AND USE OF REPORTS ADDRESSING GENERAL WASTE DISCHARGE REQUIREMENTS UNDER ORDER WQ 2017-0023-DWQ

Prepared by Timberland Resource Consultants

1. This document has been prepared for the property within APN 210-071-013-000, in Humboldt County, for enrollment in the General Waste Discharge Order WQ 2017-0023-DWQ.
2. Timberland Resource Consultants does not assume any liability for the use or misuse of the information in this document.
3. The information is based upon conditions apparent to Timberland Resource Consultants at the time inspection(s) were conducted. Changes due to land use activities or environmental factors occurring after inspection, have not been considered in this document.
4. Maps, photos, and any other graphical information presented in this report are for illustrative purposes. Their scales are approximate, and they are not to be used for locating and establishing boundary lines.
5. The conditions presented in this document may differ from those made by others or from changes on the property occurring after inspections were conducted. Timberland Resource Consultants does not guarantee this work against such differences.
6. Timberland Resource Consultants did not conduct an investigation on a legal survey of the property.
7. Persons using this document are advised to contact Timberland Resource Consultants prior to such use.
8. Timberland Resource Consultants will not discuss this document or reproduce it for anyone other than the Client for which this document was prepared without authorization from the Client.



Jessie Cahill
Timberland Resource Consultants

Monitoring Plan

Cannabis cultivators shall regularly inspect and maintain the condition of access roads, access road drainage features, and watercourse crossings. At a minimum, cannabis cultivators shall perform inspections prior to the onset of fall and winter precipitation and following storm events that produce at least 0.5 in/day or 1.0 inch/7 days of precipitation. See Required Monitoring tables below for site specific monitoring and reporting requirements. Cannabis cultivators are required to perform all of the following maintenance:

- Remove any wood debris that may restrict flow in a culvert.
- Remove sediment that impacts access road or drainage feature performance.
- Place any removed sediment in a location outside the riparian setbacks and stabilize the sediment.
- Maintain records of access road and drainage feature maintenance for annual reporting.

Cannabis cultivators that are operating in areas that are, or may become, inaccessible during winter months due to extreme weather such as snow, road closures, seasonal access roads to the property, or any other such conditions shall make additional efforts to enhance winterization measures in the absence of monitoring during storm events.

Monitoring Requirements

(Tier 2, Low Risk, < 1 acre of cultivation)

Monitoring Requirement	Description
Winterization Measures Implemented	Report winterization procedures implemented, any outstanding measures, and the schedule for completion.
Tier Status Confirmation	Report any changes in the tier status.
Third Party Identification	Report any change in third party status as appropriate.

Annual Reporting

Annual Reports shall be submitted to the North Coast Regional Water Quality Control Board by March 1st following the year being monitored. The first Annual Report for this enrollment shall be submitted by March 1st, 2020 and report on monitoring done during the 2019 calendar year. Annual reporting is required each subsequent year of enrollment.



Treatment Implementation Schedule

Unique Point	Proposed Work Completion Date
Site 01	Prior to 10/15/19 pending the approval of any required permits
Site 02	Prior to 10/15/20 pending the approval of any required permits
Site 03	Immediately
Site 04	-
Site 05	Immediately
Site 06	-
Site 07	Immediately
Site 08	Immediately
Site 09	Immediately
Site 10	Interim measures Immediately; Mitigation measures prior to 10/15/19 pending the approval of
Site 11	Immediately
Site 12	Immediately
Site 13	Immediately
Site 14	-
Site 15	Prior to 10/15/20 pending the approval of any required permits
Site 16	Immediately
Site 17	Prior to 10/15/20 pending the approval of any required permits
Site 18	Annually prior to 10/15
Site 19	Immediately
Site 20	Immediately
Site 21	As required
Site 22	Prior to 10/15/20 pending the approval of any required permits
Site 23	Prior to 10/15/19
Eastern ATV Trail	Prior to 10/15/20 pending the approval of any required permits
Improperly stored inorganic wastes	Immediately



SMP - Mitigation Report

WDID# - 1_12CC404376

Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 01	-123.698566 40.428626	Permanent	X	X	-	Prior to 10/15/19 pending the approval of any required permits	
Current Condition: Exsiting rolling dip which was observed to not be functioning properly. The drainage feature lacks adequate definition.						Prescribed Action: Redefine the drainage feature to the specifications outlined for a Type-1 rolling dip. See attached BMP's, Rolling Dip Design and Placement BMP.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 02	-123.698926 40.428885	Permanent	X	X	X	Prior to 10/15/20 pending the approval of any required permits	
Current Condition: Spatial reference to the location where a Class III watercourse reaches the permanent access road, and travels down the road surface, causing erosion as it reaches the Class II Mule Creek below.						Prescribed Action: Install a new 30" diameter, culverted watercourse crossing at this location. See attached BMP's, Permanent Culvert Crossing BMP.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 03	-123.699034 40.428952	-	X	X	-	Immediately	
Current Condition: Exposed fertilizers and soil cubes which were observed to be stored within the riparian setback, as well as delivering to the Class II Mule Creek below.						Prescribed Action: All fertilizers and soils are to be stored in a location which is outside of all riparian setbacks, and in a manner in which they cannot be transported by wind or rain into Waters of the State. See attached BMP's General Operations BMP.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 04	-123.699251 40.429012	Permanent	-	X	-	-	
Current Condition: Existing, permanent, double-wide railcar bridge over the Class II Mule Creek watercourse. The structure is approximately 10-12' over the channel, and 40' long. The bridge is situated at a height to prevent interference with water flows associated with the 100-year peak streamflow scenario.						Prescribed Action: None.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 05	-123.699847 40.429089	Permanent	X	X	-	Immediately	
Current Condition: Existing crossing of a Class III watercourse. The structure is a 60" diameter, 20' long, CMP permanent culvert crossing. The inlet and outlet feature large, heavy boulders for rock armoring, and energy dissipating rock at the outlet. The culvert size has been determined to be adequate to pass flows associated with a 100-year peak streamflow scenario. Vegetation located in the upstream bed has caused sediment accumulation, and a possibility of plugging.						Prescribed Action: The Cultivator shall clear the bed upstream of the inlet of vegetation, to prevent sediment buildup and the possibility of plugging.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 06	-123.700268 40.429094	Seasonal	X	X	-	-	
Current Condition: Road surface runoff has created a gully which spans up and downslope of this location.						Prescribed Action: The Cultivator shall fill in the gully to prevent further channelization of water, and erosion of the road surface. This stretch of road is then to be rocked to prevent erosion of the road surface, and the possibility of delivery to the surrounding watercourses.	



SMP - Mitigation Report

WDID# - 1_12CC404376

Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 07	-123.700522 40.429007	-	X	X	-	Immediately	
<p>Current Condition: Existing burn pile located within the riparian setback. The pile was found to be containing both inorganic waste, and dead plant material.</p>						<p>Prescribed Action: Inorganic waste is to be properly stored, outside of all riparian setbacks, in a manner in which it cannot be transported by wind or rain into Waters of the State. It is then to be properly disposed of at an appropriate waste transfer facility. While burn piles are an acceptable way of disposing of organic wastes, they must be located outside of all riparian setbacks.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 08	-123.70074 40.428962	-	X	X	-	Immediately	
<p>Current Condition: Exposed fuel transfer tank and hand-can located within the riparian setback. Both storage tanks were found to be lacking top cover and secondary containment basins.</p>						<p>Prescribed Action: The Cultivator shall drain both of the tanks of all fluids they are currently holding, or relocate them to a location which is outside of the riparian setback. All storage tanks containing fuel or other petroleum products are required to have adequate top cover, and secondary containment. Secondary containment is required to have, at minimum, a volume which is equal to or greater than that of the fluids in which it is stored under, to prevent transport away from the site in the case of a tank leak or failure.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 09	-123.700817 40.428993	-	X	X	-	Immediately	
<p>Current Condition: Exposed, unused potting soil from a dump truck delivery located within the riparian setback.</p>						<p>Prescribed Action: The pile is to be relocated, outside of all riparian setbacks, and stored in a manner in which wind and rain cannot transport it into Waters of the State.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 10	-123.700711 40.429271	-	X	X	-	Interim measures immediately; Mitigation measures prior to 10/15/19 pending the approval of any required permits	
<p>Current Condition: Two, 550-gallon red diesel storage tanks. Both tanks have top cover and secondary containment, however, water and diesel fuel were found to be within the secondary containment basin.</p>						<p>Prescribed Action: Interim Measure: Drain the secondary containment basin of water and diesel fuel. Properly dispose of the tainted water and reinstall the drain plug to the basin. Permanent Measure: The Cultivator shall expand the current roofing, or install walls around the tanks to prevent wind-blown rain from entering the secondary containment basins, which render them ineffective and provide the potential for leakage into the surrounding environment.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 11	-123.700602 40.429149	-	X	X	-	Immediately	
<p>Current Condition: Storage shed containing a generator and fuel. The shed featured a concrete floor which is of an adequate size to serve as the secondary containment basin for all liquids stored within the shed. The shed was however determined to be within the riparian setbacks of the Class II Mule Creek.</p>						<p>Prescribed Action: All generators, fuel, and other petroleum products are to be stored outside of all riparian setbacks, and in a manner in which they cannot be transported by wind or rain into Waters of the State. The Cultivator shall relocate the shed and/or materials to a location which is outside of all riparian setbacks.</p>	



SMP - Mitigation Report

WDID# - 1_12CC404376

Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 12	-123.700568 40.429153	-	X	X	-	Immediately	
<p>Current Condition: Exposed fuel in a 55-gallon oil drum. The drum was found to be lacking any form of top cover and secondary containment. The fuel was also found to be located within the riparian setbacks.</p>						<p>Prescribed Action: All fuel and other petroleum products are to be stored outside of all riparian setbacks, and in a manner in which they cannot be transported by wind or rain into Waters of the State. The Cultivator shall relocate the fuel to a location which is outside of all riparian setbacks. The fuel is required to be stored with adequate top cover, and secondary containment. Secondary containment is required to have, at minimum, a volume which is equal to or greater than that of the fluids in which it is stored under, to prevent transport away from the site in the case of a tank leak or failure.</p>	
Site 13	-123.700358 40.429303	-	X	X	-	Immediately	
<p>Current Condition: Spatial reference to two, 20' conex boxes which are currently used for storage. These structures were found to be within the riparian setback of a Class III watercourse.</p>						<p>Prescribed Action: The Cultivator shall relocate the storage boxes, or the chemicals, to a location which is outside of all riparian setbacks. The chemicals are required to be stored outside of all riparian setbacks, and in a manner in which they cannot be transported by wind or rain into Waters of the State.</p>	
Site 14	-123.700213 40.429178	-	X	X	-	-	
<p>Current Condition: Chemical toilet from Six Rivers Portable Toilets, which was found to be within the riparian setbacks.</p>						<p>Prescribed Action: The Cultivator shall relocate the chemical toilet to a location which is outside of all riparian setbacks.</p>	
Site 15	-123.69934 40.429279	Trail	X	X	-	Prior to 10/15/20 pending the approval of any required permits	
<p>Current Condition: Existing, structureless watercourse crossing which is currently best described as a dirt ford. The area of the crossing is approximately 10' x 6'. An old, steep, unused ATV trail that lacks waterbreaks intersects this Class III watercourse. The northern approach was found to be delivering road fill and small rocks into the crossing.</p>						<p>Prescribed Action: The crossing is to be decommissioned per the specifications outlined in the attached BMP's. This decommissioning can be performed without the use of heavy equipment. The Cultivator shall remove all fill material within the stream channel, and excavate to recreate the grade and orientaton of the orginal channel. The excavation of this channel involves the removal of approximately 1-2 cubic yards of fill. Both of the excavated banks shall be seeded and straw mulched. The northern approach shall be seeded and mulched up to the first waterbar. See attached BMP's, Crossing Abandonment BMP.</p>	
Site 16	-123.699463 40.429309	-	X	X	-	Immediately	
<p>Current Condition: Wet concrete which was dumped over the outboard berm of a permanent access road, and was found to be within the riparian setback of the Class III watercourse below.</p>						<p>Prescribed Action: The concrete shall be removed and properly disposed of at an appropriate waste transfer facility.</p>	



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Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 17	-123.69935 40.43037	Trail	X	X	-	Prior to 10/15/20 pending the approval of any required permits	
Current Condition: Water pooling was observed within wheel ruts worn into the surface of this trail.						Prescribed Action: Install a new cross drain to allow proper road surface drainage at this location.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 18	-123.700273 40.43116	-	X	X	-	Annually prior to 10/15	
Current Condition: Exposed water pump with no top cover or secondary containment.						Prescribed Action: The Cultivator shall drain the pump of all petroleum products, or properly store the pump for the duration of the winter months.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 19	-123.700668 40.431148	-	X	X	-	Immediately	
Current Condition: Steep cutbank north of Cultivation Area B. Minor slumping was observed at this location.						Prescribed Action: The cutbank shall be laid back to a stable angle. Seed, straw mulch, and jute netting shall be installed to properly stabilize the fill material in place, and to prevent further slumping. The slumped sediment shall be relocated to an area of gently sloped ground, outside of riparian setbacks, where it does not have the potential to be transported by wind or rain into any Waters of the State. The Cultivator will spread it thinly, and seed and straw mulch the soil to stabilize it in place. See attached BMP's, General Erosion Control BMP, Unstable Fill Removal and Treatment BMP.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 20	-123.701062 40.431072	-	X	X	-	Immediately	
Current Condition: Existing slumping of the outboard fill material on the western edge of a graded flat.						Prescribed Action: The outboard berm shall be laid back to a stable angle. Seed, straw mulch, and jute netting shall be installed to properly stabilize the fill material in place, and to prevent further slumping. The slumped sediment shall be relocated to an area of gently sloped ground, outside of riparian setbacks, where it does not have the potential to be transported by wind or rain into any Waters of the State. The Cultivator will spread it thinly, and seed and straw mulch the soil to stabilize it in place. See attached BMP's, General Erosion Control BMP, Unstable Fill Removal and Treatment BMP.	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 21	-123.7008 40.431208	-	-	X	-	As required	
Current Condition: Location of a section of the graded flat which has settled approximately 3" vertically, spanning approximately 15' long.						Prescribed Action: This site shall be monitored for additional settling, or any further signs of instability.	



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Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 22	-123.70068 40.431267	-	X	X	-	Prior to 10/15/20 pending the approval of any required permits	
<p>Current Condition: Significant slumping of a cutbank has caused fill material to drop onto the graded flat below, where it extends half-way through a greenhouse located directly below it.</p>						<p>Prescribed Action: The cutbank shall be laid back to a stable angle. Seed, straw mulch, and jute netting shall be installed to properly stabilize the fill material in place, and to prevent further slumping. The slumped sediment shall be relocated to an area of gently sloped ground, outside of riparian setbacks, where it does not have the potential to be transported by wind or rain into any Waters of the State. The Cultivator will spread it thinly, and seed and straw mulch the soil to stabilize it in place. See attached BMP's, General Erosion Control BMP, Unstable Fill Removal and Treatment BMP.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Site 23	-123.69886 40.428898	-	X	X	-	Prior to 10/15/19	
<p>Current Condition: Location where unused, exposed, potting soil is stored within the riparian setback. The proximity to the surrounding watercourses presents the possibility of delivery.</p>						<p>Prescribed Action: All fertilizers and soils are to be stored in a location which is outside of all riparian setbacks, and in a manner in which they cannot be transported by wind or rain into Waters of the State. See attached BMP's General Operations BMP.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Eastern ATV Trail	-	Trail	X	X	-	Prior to 10/15/20 pending the approval of any required permits	
<p>Current Condition: This steep, unused ATV trail lacks drainage breaks, and was found to be delivering sediment to the Class III watercourse below.</p>						<p>Current Condition: Use of this ATV trail shall be discontinued immediately. Waterbars shall be installed to prevent concentrated road surface runoff, and the subsequent erosion of the road surface. Waterbars shall be installed per the specifications outlined in the BMP's, at intervals of 50'. See attached BMP's, Waterbar Construction BMP.</p>	
Unique Point	Lat-Long NAD 83	Road Type	Mitigation Planned	Monitor	1600	Treatment Priority	Date Completed
Improperly stored inorganic wastes	-	-	X	X	-	Immediately	
<p>Current Condition: Inorganic waste was found dispersed throughout the property. Due to the proximity of multiple watercourses on the property, these wastes have the potential of being transported by wind or rain into Waters of the State.</p>						<p>Prescribed Action: The Cultivator shall collect all improperly stored wastes, and ensure that they are appropriately stored, in a manner that will prevent them from being transported into the nearby watercourses.</p>	

Site Management Plan

Site Map [WDID - 1_12CC404376]

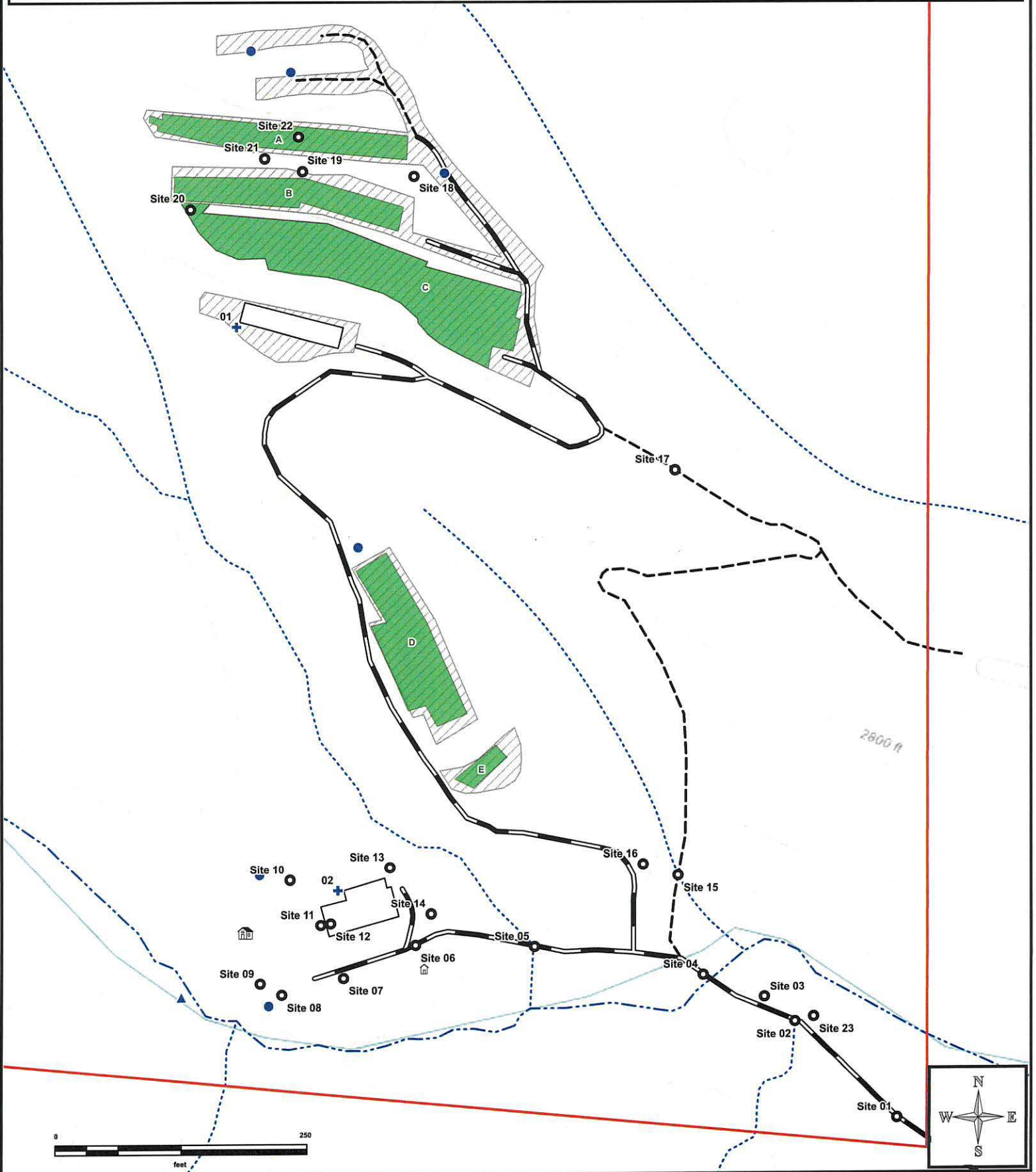


- Property Boundary
- Structure
- Cultivation Area
- Disturbed Area

- Roads**
- Permanent
- Trail
- Watercourses**
- Class II
- Class III

- Site
- POD
- Tank
- Well
- House

TRC-416



Site Management Plan

Site Map [WDID - 1_12CC404376]



- Property Boundary
- Structure
- Cultivation Area
- Disturbed Area

- Roads**
- Permanent
- Trail
- Watercourses**
- Class II
- Class III

- Site
- POD
- Tank
- Well
- House

TRC-416



Attachments

Implementation of Applicable BPTC Measures

Assessment of applicable BPTC measures consisted of a field examination on March 13, 2019. Anywhere applicable BPTC measures are not met on the property, descriptions of the assessments and the prescribed treatments are outlined following each associated section below.

Summary of BPTC Measures Compliance

1. Sediment Discharge BPTC Measures Y/N
2. Fertilizer, Pesticide, Herbicide, and Rodenticide BPTC Measures Y/N
3. Petroleum Product BPTC Measures Y/N
4. Trash/Refuse, and Domestic Wastewater BPTC Measures Y/N
5. Winterization BPTC Measures Y/N

1. Sediment Discharge BPTC Measures

1.1. Site Characteristics

- 1.1.1. Provide a map showing access roads, vehicle parking areas, streams, stream crossings, cultivation site(s), disturbed areas, buildings, and other relevant site features.

See attached Site Map.

- 1.1.2. Describe the access road conditions including estimating vehicle traffic, road surface (e.g., paved, rocked, or bare ground), and maintenance activities. Describe how storm water is drained from the access road (e.g., crowned, out slope, armored ditch, culverts, rolling dips, etc.).

See sections “Land Development and Maintenance, Erosion Control, and Drainage Features” and above, and the attached Mitigation Report, Site Maps, and Treatment Implementation Schedule for site specific descriptions, treatments, and the implementation schedule.

- 1.1.3. Describe any vehicle stream crossing including the type of crossing (e.g., bridge, culvert, low water, etc.).

See the section titled “Stream Crossing Installation and Maintenance” or the attached Mitigation Report and Site Maps for site specific details and treatment schedules.

- 1.1.3.1. For Region 1 Dischargers, identify, discuss, and locate on the site map any legacy waste discharge issues that exist on the property.

Not applicable. No legacy waste discharge issues were identified during the assessment of the property.

1.2. Sediment Erosion Prevention and Sediment Capture (Moderate risk Tier 1 or Tier 2 Dischargers are required to submit a Site Erosion and Sediment Control Plan. Those Dischargers may refer to that plan rather than repeat it here)

1.2.1. Erosion Prevention BPTC Measures

1.2.1.1. Describe the BPTC measures that have been, or will be implemented to prevent or limit erosion. Provide an implementation schedule for BPTC measures that have not yet been implemented. Identify the erosion prevention BPTC measures on a site map.

See the attached Mitigation Report, Site Maps, and Treatment Implementation Schedule for site specific descriptions, treatments, and the implementation schedule.

1.2.1.1.1. The description shall address physical BPTC measures, (e.g., placement of straw mulch, plastic covers, slope stabilization, soil binders, culvert outfall armoring, etc.) and biological BPTC measures (vegetation preservation/replacement, hydro seeding, etc.).

See sections “Land Development and Maintenance, Erosion Control, and Drainage Features” and “Riparian and Wetland Protection and Management” above, and the attached Mitigation Report and BMPs for descriptions of physical and biological BPTC measures being prescribed.

1.2.2. Sediment Control BPTC Measures

1.2.2.1. Describe the BPTC measures that have been, or will be implemented to capture sediment that has been eroded. Provide an implementation schedule for BPTC measures that have not yet been implemented. Identify the sediment control BPTC measures on a site map.

Not applicable. No BPTC measures have been, or will need to be, implemented to capture sediment that has been eroded.

1.2.2.1.1. The description shall address physical BPTC measures, (e.g., placement of silt fences, fiber rolls, or settling ponds/areas, etc.) and biological BPTC measures (vegetated outfalls, hydro seeding, etc.).

See sections “Land Development and Maintenance, Erosion Control, and Drainage Features” and “Riparian and Wetland Protection and Management” above, and the attached Mitigation Report and BMPs for descriptions of physical and biological BPTC measures being prescribed.

1.2.3. Maintenance Activities - Erosion Prevention and Sediment Control

- 1.2.3.1. Describe how the erosion prevention and sediment control BPTC measures will be monitored and maintained to protect water quality.

Erosion prevention BPTC measures and all corresponding work shall be inspected prior to and in conjunction with winter monitoring, as described above under the “Monitoring Plan” to ensure proper placement, installation, and function remain intact prior to and throughout the Winter Period.

- 1.2.3.2. Describe how any captured sediment will be either stabilized in place, excavated and stabilized on-site, or removed from the site.

Not applicable.

- 1.2.4. Erosion control BPTC measures: Describe the interim soil stabilization, if applicable and long-term BPTC measures implemented to prevent sediment transport at each identified disturbed area(s) and improperly constructed features.

See sections “Land Development and Maintenance, Erosion Control, and Drainage Features” and “Riparian and Wetland Protection and Management” above, and the attached Mitigation Report and BMPs for descriptions of physical and biological BPTC measures being prescribed.

2. Fertilizer, Pesticide, Herbicide, and Rodenticide BPTC Measures

- 2.1. Provide a summary table that identifies the products used at the site, when they are delivered to the site, how they are stored, and used at the site. If products are not consumed during the growing season, describe how they are removed from the site or stored to prevent discharge over the winter season.

Chicken manure is brought on site prior to the cultivation season and used immediately. No products are stored on site.

- 2.2. Provide a site map that locates storage locations.

See attached Site Map. Fertilizers and soil amendments are currently stored properly in the permanent carport on the property, west of the primary residence.

- 2.3. Describe how bulk fertilizers and chemical concentrates are stored, mixed, applied, and how empty containers are disposed.

Not applicable.

- 2.4. Describe procedures for spill prevention and cleanup.

Not applicable.

3. Petroleum Product BPTC Measures

3.1. Provide a summary table that identifies the products used at the site, when they are delivered to the site, how they are stored, and used at the site. If products are not consumed during the growing season, describe how they are removed from the site or stored to prevent discharge over the winter season.

See comprehensive table under 3.3.

3.2. Provide a site map that locates storage locations.

See attached Site Map.

3.3. Describe how fuels, lubricants, and other petroleum products are stored, mixed, applied, and empty containers are disposed.

Petroleum Products

Products used on site	When they are delivered to site	How they are stored and used	How removed or stored
Gasoline	Brought to site in May 2018.	Stored in standard 5-gallon gasoline canisters, as well as a 90-gallon fuel tank, separately from fertilizers in the storage shed identified as Site 11. Used to fuel hand equipment.	Stored in its own area away from fertilizers in the storage structure.
Red Diesel	Brought to site in May 2018.	The diesel is stored in two, 550-gallon fuel tanks which are identified as Site 10. The tanks are located under top cover, and above adequate secondary containment.	Stored in its own area away from fertilizers in the storage structure.
Motor Oil	Brought to site in May 2018.	Stored in plastic jugs they were purchased in, in a purpose-built structure separately from fertilizers.	Stored in its own area away from fertilizers in the storage structure.

3.4. Describe procedures for spill prevention and cleanup.

Any/all fuel canisters and motor oil containers shall be stored in secondary containment (e.g. plastic totes or sealed metal boxes) while being stored long term or not in immediate use, wherever these materials are used anywhere on the property. Adequate quantities of absorbent materials are stored at all locations where these types of materials are used, stored, or mixed. Should a spill of these materials occur, absorbent materials will be applied immediately and allowed enough time to absorb as much material as possible. Following treatment, absorbent materials applied as well as any contaminated soil will be removed and disposed of appropriately for the spilled material.

4. Trash/Refuse, and Domestic Wastewater BPTC Measures

- 4.1. Describe the types of trash/refuse that will be generated at the site. Describe how the material is contained and properly disposed of.

Domestic and commercial cannabis trash and refuse will be generated at the site. The trash/refuse is stored securely in trash bags and trash bins at the cultivation areas and residence prior to disposal at an appropriate waste disposal facility.

- 4.1.1. Provide a site map that locates the trash/refuse storage locations.

Trash and refuse are stored in trash bags and trash bins at mapped cultivation areas, and the residence. See attached Site Map.

- 4.2. Describe the number of employees, visitors, or residents at the site.

There are two regular employees who are at the site during the cultivation season. Additional employees are brought onto the property for short periods of time to complete projects requiring additional employees. Visitors are occasionally on site, including consultants and regulatory agencies. There is also a full-time residence on the property as well.

- 4.2.1. Describe the types of domestic wastewater generated at the site (e.g., household generated wastewater or chemical toilet).

Domestic sewage and wastewater (greywater) are generated on site.

- 4.2.2. Describe how the domestic wastewater is disposed.

The septic tank on the property has not yet required servicing.

- 4.2.2.1. Permitted onsite wastewater treatment system (e.g., septic tank and leach lines).

Domestic sewage is disposed via a septic system, and a portable toilet which is attached to the residence on the property.

- 4.2.2.2. Chemical toilets or holding tank. If so, provide the name of the servicing company and the frequency of service.

Six Rivers Portable Toilets.

- 4.2.2.3. Outhouse, pit privy, or similar. Use of this alternative requires approval from the Regional Water Board Executive Officer; include the approval from the Executive Officer and any conditions imposed for use of this alternative.

None present at time of site inspection.

- 4.2.2.3.1. Provide a site map that locates any domestic wastewater treatment, storage, or disposal area.

See attached Site Map.

5. Winterization BPTC Measures

- 5.1. Describe activities that will be performed to winterize the site and prevent discharges of waste. The description should address all the issues listed above.

See Mitigation Report and Annual Winterization Measures for prescribed general winterization measures that will be performed prior to each Winter Period, and site specific interim measures that will be performed prior to the Winter Period until permanent, prescribed treatments can be executed.

- 5.2. Describe maintenance of all drainage or sediment capture features (e.g., drainage culverts, drainage trenches, settling ponds, etc.) to remove debris, soil blockages, and ensure adequate capacity exists.

Existing drainage structures will be repaired as feasible and necessary with hand tools during annual winterization and winter monitoring. Prescribed repair and maintenance will be executed in accordance with the Mitigation Report and Treatment Implementation Schedules.

- 5.3. Describe any revegetation activities that will occur either at the beginning or end of the precipitation season.

See attached Mitigation Report and Treatment Implementation Schedule above.

- 5.4. If any BPTC measure cannot be completed before the onset of Winter Period, contact the Regional Water Board to establish a compliance schedule.

See attached Mitigation Report and Treatment Implementation Schedule above.

- 5.5. For Region 1 Dischargers, describe any activities that will be performed to address legacy waste discharge issues. Region 6 Dischargers should consult with Regional Water Board staff to confirm if any other activities in addition to BPTCs are necessary to address legacy waste discharge issues.

See attached Mitigation Report and Treatment Implementation Schedule above.

Photographs



Photo #1: Photograph showing Cultivation Area C.



Photo #2: Photograph showing the cut-bank slump identified as Site 22.



Photo #3: Photograph showing the structureless watercourse crossing identified as Site 15.



Photo #4: Photograph showing the fertilizers and soil which were found delivering to the Class II Mule Creek below.

BMP: Winterization and Interim Treatments for Erosion Control

• Roads

- Existing or newly installed road surface drainage structures such as water bars, rolling dips, ditch relief culverts, and intentionally in/out-sloped segments of road shall be maintained to ensure continued function of capturing and draining surface runoff.
- Hand tool kick-outs (lead out ditch) for existing wheel rut, surface run-off confinement.
- Temporary waterbar/cross-wattles installed on road/trail sections of concentrating surface runoff.
- Clean existing ditch relief culvert inlets, outlets, and contributing ditch lines of current and potential blockage debris by hand.
- Hand place energy dissipating rock/small woody debris at ditch relief culvert outlets where erosion is occurring.
- Wattles/straw bales placed at road runoff delivery sites.
- Touch-up with hand tools of existing surface drainage structures (kick-outs, rolling dips, and waterbars).
- Seed and straw un-used, or to be abandoned, road surfaces where erosion is occurring.
- Frequent use of un-surfaced roads should be avoided, particularly when road surfaces are soft/saturated.

• Crossings

- Clean inlets, outlets, and channels above of current and potential blockage debris by hand.
- Hand place energy dissipating rock/small woody debris at ditch relief culvert outlets.
- Hand placement of rock armor around culvert inlets.
- Install staked wattles along the outboard road edge of out-sloped watercourse crossings where direct delivery of road surface runoff is occurring.
- Hand placement of rock on crossing fill faces where erosion is/may occur as a result of poor crossing construction.

• Cultivation Areas

- Use hand tools to capture cultivation related soils that are not contained (soil from post-harvest plant removal, soil/planter removal, general spillage).
- Treat beds, pots, new soil storage piles, spent soil piles, and soil disposal piles with cover crops for soil stability and potentially nitrogen fixing/soil amendment.
- Bagged potting soil should be covered.
- Install staked wattles or an earthen berm around cultivation soils piles prior to the winter period, annually.
- Any soil amendment, fertilizer, herbicide, or pesticide that is not 100% sealed should be stored under cover.
- Cultivation sites with poor or concentrating drainage can have wattles or bales installed prior to winter to help prevent sediment and nutrients from leaving the site.
- Plastic netting shall be disposed of or stored where it is inaccessible to wildlife.
- Tarps/dep covers shall be stored so they cannot be blown away.
- General waste from growing season gathered up and disposed of.
- Exposed soil surfaces in the cultivation area, as well as graded fill slopes should be seeded, strawed, mulched, jute netted as needed.

• General Areas

- Remove all refuse prior to leaving property for the season.
- Back fill pit toilets to be abandoned.

BMP: General Recommendations

- **Fertilizers, soil amendments, and pesticides**
 - Fertilizer, soil amendments, and pesticide use it to be recorded in such a manner that cumulative annual totals are recorded for annual reporting.
 - Store in-use fertilizers in a securable storage container, such as a tote or deck box, adjacent to the mixing tanks.

- **Petroleum products and hazardous materials**
 - Utilize spill trays/containment structures and cover over the containment when using, fueling, changing oil on portable generators or petroleum powered water pumps to prevent the potential for leeching, seepage or spillage of petroleum products.
 - It is recommended that all petroleum products and other chemicals are registered with the California Environmental Reporting System (CERS) to satisfy future licensing requirements.

- **Water storage and Use**
 - Water use shall be designed and metered such that water used for the irrigation of cannabis will be recorded separately from domestic use. Water use for the irrigation of cannabis is to be recorded monthly for annual reporting.
 - Ensure lids are secured on all water storage tanks to prevent wildlife from becoming entrapped within the tank.
 - Install float valves, or implement another equivalent system, on all applicable water storage and transfer tanks to prevent unnecessary water diversion and the overflowing of water tanks.

BMP: General Operations BMPs

- If operations require moving of equipment across a flowing stream, such operations shall be conducted without causing a prolonged visible increase in stream turbidity. For repeated crossings, the operator shall install a bridge, culvert, or rock-lined crossing.
- During construction in flowing water, which can transport sediment downstream, the flow shall be diverted around the work area by pipe, pumping, temporary diversion channel or other suitable means. When any dam or artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain fish life below the dam. Equipment may be operated in the channel of flowing live streams only as necessary to construct the described construction.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. The disturbed portion of any stream channel shall be restored to as near their original condition as possible. Restoration shall include the mulching of stripped or exposed dirt areas at crossing sites prior to the end of the work period.
- Structures and associated materials not designed to withstand high seasonal flow shall be removed to areas above the high-water mark before such flows occur.
- No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete washing, oil or petroleum products, or other organic or earthen material from any logging, construction, or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high-water mark of any stream.

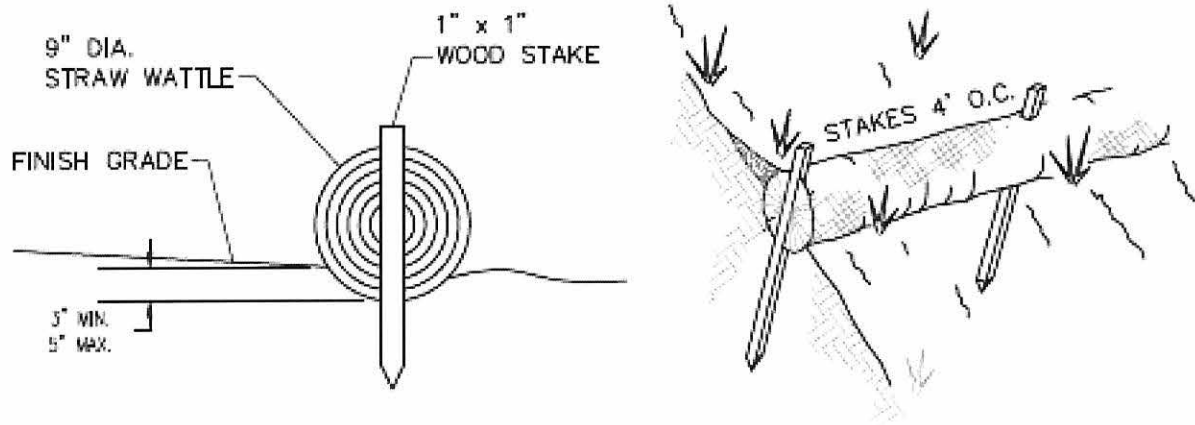
BMP: General Erosion Control

- Timing for soil stabilization measures within the 100 feet of a watercourse or lake: For areas disturbed from May 1 through October 15, treatment shall be completed prior to the start of any rain that causes overland flow across or along the disturbed surface. For areas disturbed from October 16 through April 30, treatment shall be completed prior to any day for which a chance of rain of 30 percent or greater is forecast by the National Weather Service or within 10 days, whichever is earlier.
- Within 100 feet of a watercourse or lake, the traveled surface of logging roads shall be treated to prevent waterborne transport of sediment and concentration of runoff that results from operations. Treatment may consist of, but not limited to, rocking, out sloping, rolling dips, cross drains, water bars, slope stabilization measures, or other practices appropriate to site-specific conditions.
- The treatment for other disturbed areas within 100 feet of a watercourse or lake, including: (A) areas exceeding 100 contiguous square feet where operations have exposed bare soil, (B) approaches to road watercourse crossings out to 100 feet or the nearest drainage facility, whichever is farthest, (C) road cut banks and fills, and (D) any other area of disturbed soil that threatens to discharge sediment into waters in amounts deleterious to the quality and beneficial uses of water, shall be grass seeded and mulched with straw or fine slash. Grass seed shall be applied at a rate exceeding 100 pounds per acre. Straw mulch shall be applied in amounts sufficient to provide at least 2- 4-inch depth of straw with minimum 90% coverage. Slash may be substituted for straw mulch provided the depth, texture, and ground contact are equivalent to at least 2 – 4 inches of straw mulch. Any treated area that has been subject to reuse or has less than 90% surface cover shall be treated again prior to the end of operations.
- Within 100 feet of a watercourse or lake, where the undisturbed natural ground cover cannot effectively protect beneficial uses of water from operations, the ground shall be treated with slope stabilization measures described in #3 above per timing described in #1 above.
- Side cast or fill material extending more than 20 feet in slope distance from the outside edge of a landing which has access to a watercourse or lake shall be treated with slope stabilization measures described in #3 above. Timing shall occur per #1 above unless outside 100 feet of a watercourse or lake, in which completion date is October 15.
- All roads shall have drainage and/or drainage collection and storage facilities installed as soon as practical following operations and prior to either (1) the start of any rain which causes overland flow across or along the disturbed surface within 100 feet of a watercourse or lake protection, or (2) any day with a National Weather Service forecast of a chance of rain of 30 percent or more, a flash flood warning, or a flash flood watch.

BMP: General Erosion Control (Cont.)

- Erosion control and sediment detention devices and materials shall be incorporated into the cleanup/restoration work design and installed prior to the end of project work and before the beginning of the rainy season. Any continuing, approved project work conducted after October 15 shall have erosion control works completed up-to-date and daily.
- Erosion control materials shall be, at minimum, stored on-site at all times during approved project work between May 1 and October 15.
- Approved project work within the 5-year flood plain shall not begin until all temporary erosion controls (straw bales or silt fences that are effectively keyed-in) are installed downslope of cleanup/restoration activities.
- Non-invasive, non-persistent grass species (e.g., barley grass) may be used for their temporary erosion control benefits to stabilize disturbed slopes and prevent exposure of disturbed soils to rainfall.
- Upon work completion, all exposed soil present in and around the cleanup/restoration sites shall be stabilized within 7 days.
- Soils exposed by cleanup/restoration operations shall be seeded and mulched to prevent sediment runoff and transport.
- Straw Wattles (if used) shall be installed with 18 or 24-inch wood stakes at four feet on center. The ends of adjacent straw wattles shall be abutted to each other snugly or overlapped by six inches. Wattles shall be installed so that the wattle is in firm contact with the ground surface.

BMP: General Erosion Control (Cont.)

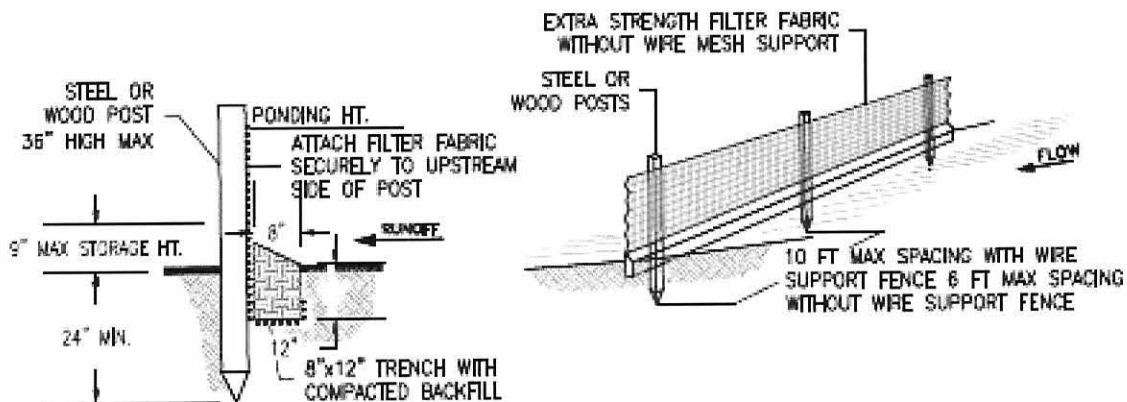


STRAW WATTLE NOTES:

1. STRAW WATTLES SHALL BE INSTALLED WITH 18 OR 24 INCH WOOD STAKES AT FOUR FEET ON CENTER. THE ENDS OF ADJACENT STRAW WATTLES SHALL BE ABUTTED TO EACH OTHER SNUGLY OR OVERLAPPED BY SIX INCHES.
2. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND THE ROLL.

STRAW WATTLE INSTALLATION DETAIL

NTS



SILT FENCE NOTES:

1. THE CONTRACTOR SHALL INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT.
2. CONTRACTOR SHALL REMOVE SEDIMENT AS NECESSARY. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND IN AN AREA THAT CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

SILT FENCE DETAILS

NTS

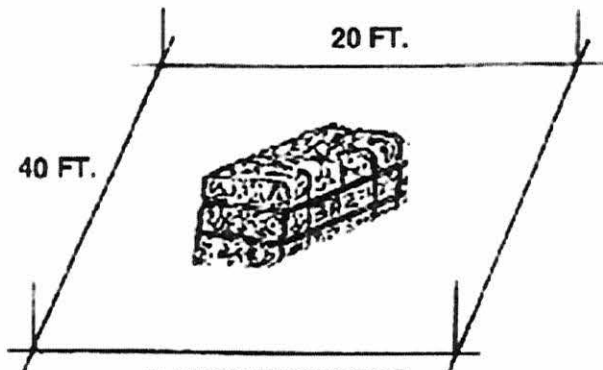
BMP: General Erosion Control (Cont.)



BMP: General Erosion Control (Cont.)

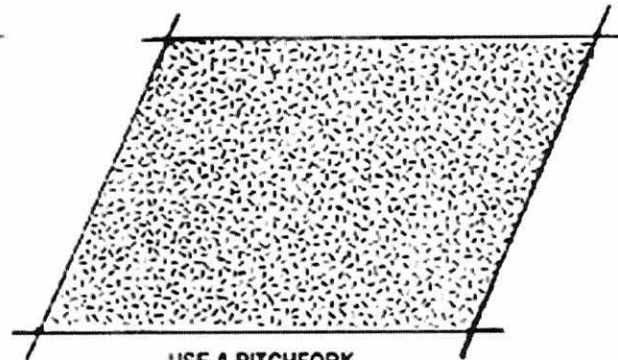
SPREAD THE STRAW

MARK OFF 800 SQ FT. PLOTS



PLACE ONE STRAW BALE PER PLOT (~74 POUNDS). THIS IS EQUIVALENT TO 2 TONS PER ACRE.

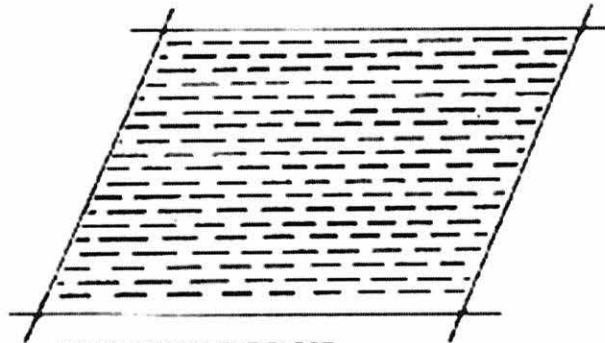
SPREAD EVENLY



USE A PITCHFORK, SPADING FORK, OR BY HAND

ANCHOR THE STRAW

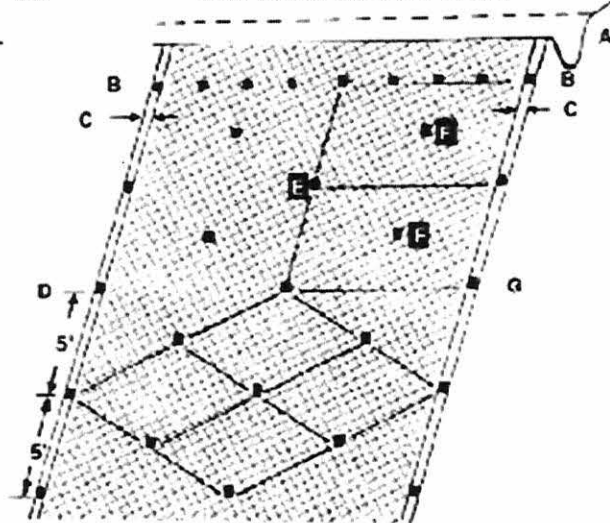
CRIMP BY HAND



WORK ACROSS THE SLOPE. PUNCH STRAW 4 INCHES DEEP. A SQUARE END SPADE WORKS WELL. MAKE PUNCH EVERY 12 INCHES.

OR

USE PLASTIC NETTING



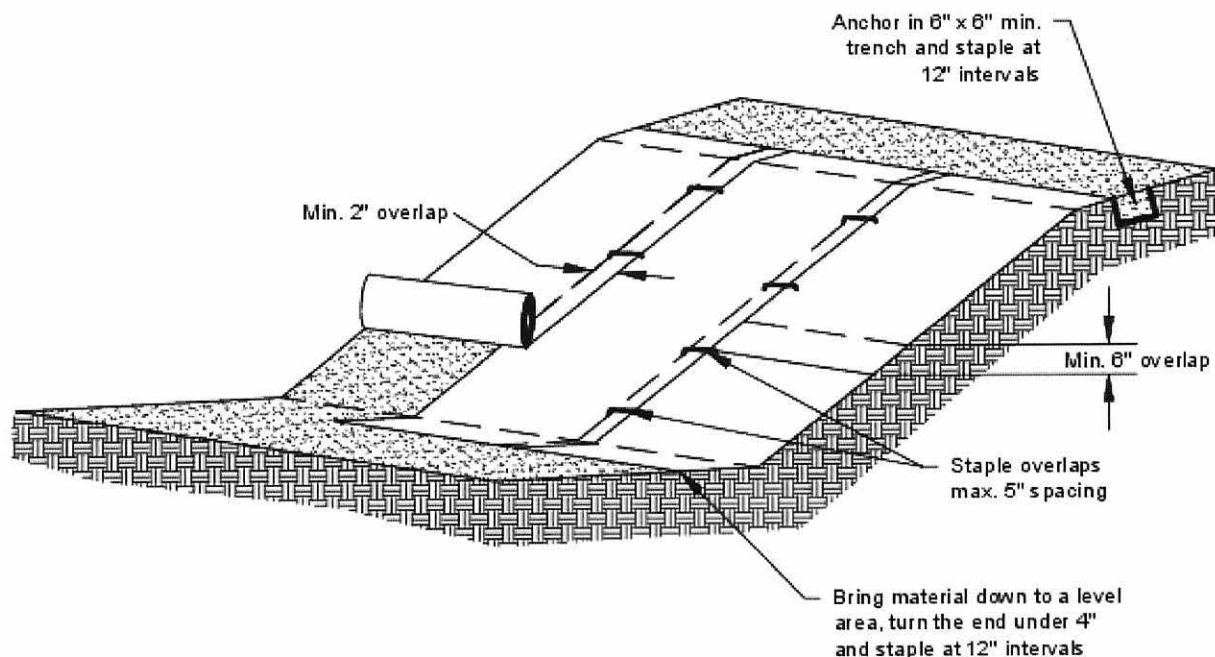
- A. LAY BIRD CONTROL NETTING OR SIMILAR MATTING IN STRIPS DOWN THE SLOPE OVER THE STRAW. BURY UPPER END IN 6-8 INCH DEEP AND WIDE TRENCH.. MOST NETTING COMES IN 14 TO 17 FT. WIDE ROLLS.
- B. SECURE THE UPPER END WITH STAKES EVERY 2 FEET.
- C. OVERLAP SEAMS ON EACH SIDE 4-5 INCHES.
- D. SECURE SEAMS WITH STAKES EVERY 5 FEET.
- E. STAKE DOWN THE CENTER EVERY 5 FEET.

F. STAKE MIDDLES TO CREATE DIAMOND PATTERN THAT PROVIDES STAKES SPACED 4-5 FEET APART.

G. USE POINTED 1X2 INCH STAKES 8 TO 9 INCHES LONG. LEAVE 1 TO 2 INCH TOP ABOVE NETTING, OR USE "U" SHAPED METAL PINS AT LEAST 9 INCHES LONG.

NOTE: WHEN JOINING TWO STRIPS, OVERLAP UPPER STRIP 3 FEET OVER LOWER STRIP AND SECURE WITH STAKES EVERY 2 FEET LIKE IN "B" ABOVE

BMP: General Erosion Control (Cont.)



Notes:

1. Slope surface shall be smooth before placement for proper soil contact.
2. Stapling pattern as per manufacturer's recommendations.
3. Do not stretch blankets/mattings tight - allow the rolls to mold to any irregularities.
4. For slopes less than 3H:1V, rolls may be placed in horizontal strips.
5. If there is a berm at the top of the slope, anchor upslope of the berm.
6. Lime, fertilize, and seed before installation. Planting of shrubs, trees, etc. should occur after installation.

NOT TO SCALE



DEPARTMENT OF
ECOLOGY
State of Washington

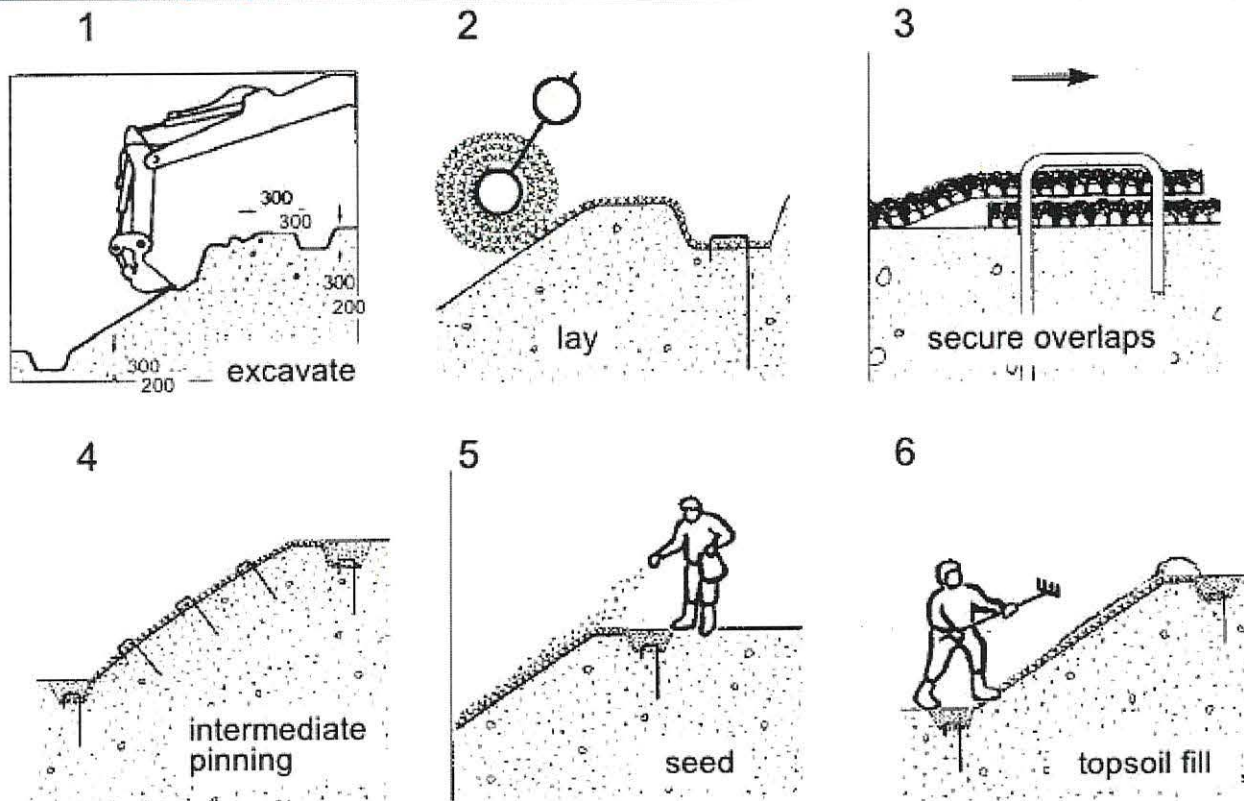
Slope Installation

Revised June 2016

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BMP: General Erosion Control (Cont.)

Installation of a geosynthetics mat - Enkamat



BMP: General Erosion Control (Cont.)

TABLE 34. Guidelines for erosion and sediment control application

Timing of application	Technique	Portion of road and construction area treated
Erosion control during construction	Hydromulching, hydroseeding	Road fill slopes, cut slopes, bare soil areas
	Dry seeding	Road fill slopes, cut slopes, bare soil areas
	Wood chip, straw, Excelsior or tackified mulch	Road fill slopes, cut slopes, bare soil areas
	Straw wattles	Road fill slopes and cut slopes
	Gravel surfacing	Road, landing and turnout surfaces
	Dust palliative	Road surfaces
	Minimize disturbance (soil and vegetation)	All areas peripheral to construction
Sediment control during construction	Sediment basin	Roadside ditches, turnouts and small stream crossings
	Sediment traps (e.g., silt fences, straw bales barriers, woody debris barriers)	Road fill slopes, cutbanks, bare soil areas and ditches
	Straw bale dams	Ditches and small streams
	Sumps and water pumps	Stream channels and stream crossings
	Streamflow diversions (e.g., temporary culverts, flex pipe, etc.)	Stream channels and stream crossings
	Surface diversion and dispersion devices (pipes, ditches, etc.)	All disturbed bare soil areas
	Road shaping	Road and landing surfaces
	Gravel surfacing	Road, landing and turnout surfaces
	Bituminous or asphalt surfacing	Road surface
	Rolling dips	Road surface
Permanent erosion control	Ditch relief culverts	Roadbed and road fill
	Downspouts and berm drains	Road fill slopes
	Waterbars	Road and landing surfaces
	Berms	Road surface and roadside areas
	Ditches	Road and landing surfaces
	Riprap	Road fill slopes, stream crossing fills, cutbanks, stream and lake banks
	Soil bioengineering	Road fill slopes, cut slopes, stream crossings, streambanks
	Tree planting	Road fill slopes, cutbanks, bare soil areas, stream crossings, streambanks

BMP: Permanent Culvert Crossing

- New culvert installations shall be sized to accommodate flows associated with a 100-year storm event.
- If the new culvert is replacing a poorly installed old culvert, the crossing may need to be abandoned to the following standard:
 - When fills are removed they shall be excavated to form a channel that is as close as feasible to natural watercourse grade and orientation, and that is wider than the natural channel.
 - Excavated banks shall be laid back to a 2:1 (50%) or natural slope.
- New culverts shall be placed at stream gradient, or have downspouts, or have energy dissipaters at outfall.
 - Align culverts with the natural stream channel orientation to ensure proper function, prevent bank erosion, and minimize debris plugging. See Figure 97 below.
 - Place culverts at the base of the fill and at the grade of the original streambed or install a downspout past the base of the fill. Downspouts should only be installed if there are no other options.
 - Culverts should be set slightly below the original stream grade so that the water drops several inches as it enters the pipe.
 - Culvert beds should be composed of rock-free soil or gravel, evenly distributed under the length of the pipe.
 - Compact the base and sidewall material before placing the pipe in its bed.
 - Lay the pipe on a well-compacted base. Poor basal compaction will cause settling or deflection in the pipe and can result in separation at a coupling or rupture in the pipe wall.
 - Backfill material should be free of rocks, limbs, or other debris that could dent or puncture the pipe or allow water to seep around the pipe.
 - Cover one end of the culvert pipe, then the other end. Once the ends are secure, cover the center.
 - Tamp and compact backfill material throughout the entire process, using water as necessary for compaction.
 - Backfill compacting will be done in 0.5 – 1.0 foot lifts until 1/3 of the diameter of the culvert has been covered.
 - Push layers of fill over the crossing to achieve the final design road grade, road fill above the culvert should be no less than one-third to one-half the culvert diameter at any point on the drivable surface.
- Critical dips shall be installed on culvert crossings to eliminate diversion potential. Refer to Figure 84 below.
- Road approaches to crossings shall be treated out to the first drainage structure (i.e. waterbar, rolling dip, or hydrologic divide) to prevent transport of sediment.
- Road surfaces and ditches shall be disconnected from streams and stream crossings to the greatest extent feasible. Ditches and road surfaces that cannot be feasible disconnected from streams or stream crossings shall be treated to reduce sediment transport to streams.
- If downspouts are used, they shall be secured to the culvert outlet and shall be secure on fill slopes.
- Culverts shall be long enough so that road fill does not extend or slough past the culvert ends.
- Inlet of culverts, and associate fill, shall be protected with appropriate measures that extend at least as high as the top of the culvert.
- Outlet of culverts shall be armored with rock if road fill sloughing into channel can occur.
- Armor inlets and outlets with rock, or mulch and seed with grass as needed (not all stream crossings need to be armored).
- Where debris loads could endanger the crossing, a debris catchment structure shall be constructed upstream of the culvert inlet.
- Bank and channel armoring may occur, when appropriate, to provide channel and bank stabilization.

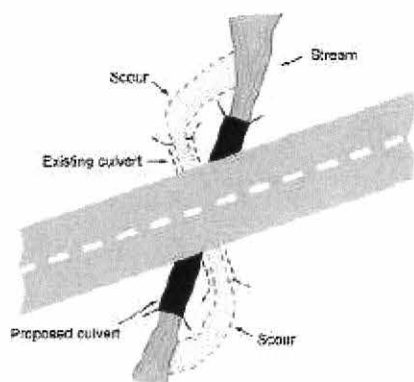


FIGURE 97. Culvert alignment should be in relation to the stream and not the road. It is important that the stream enters and leaves the culvert in a relatively straight horizontal alignment so streamflow does not have to turn to enter the inlet or discharge into a bank as it exits. This figure shows a redesigned culvert installation that replaces the bending alignment that previously existed. Channel turns at the inlet increase plugging potential because wood going through the turn will not align with the inlet. Similarly, channel turns at the inlet and outlet are often accompanied by scour against the channel banks (Wisconsin Transportation Information Center, 2004).

HANDBOOK FOR FOREST, RANCH AND RURAL ROADS

BMP: Permanent Culvert Crossing Design (Critical Dip and Hydrologic Disconnect Placement)

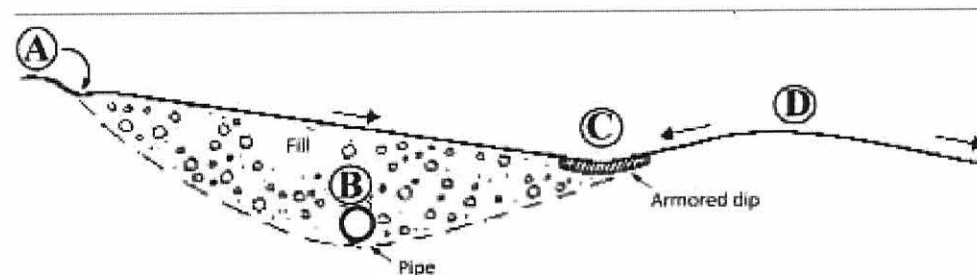
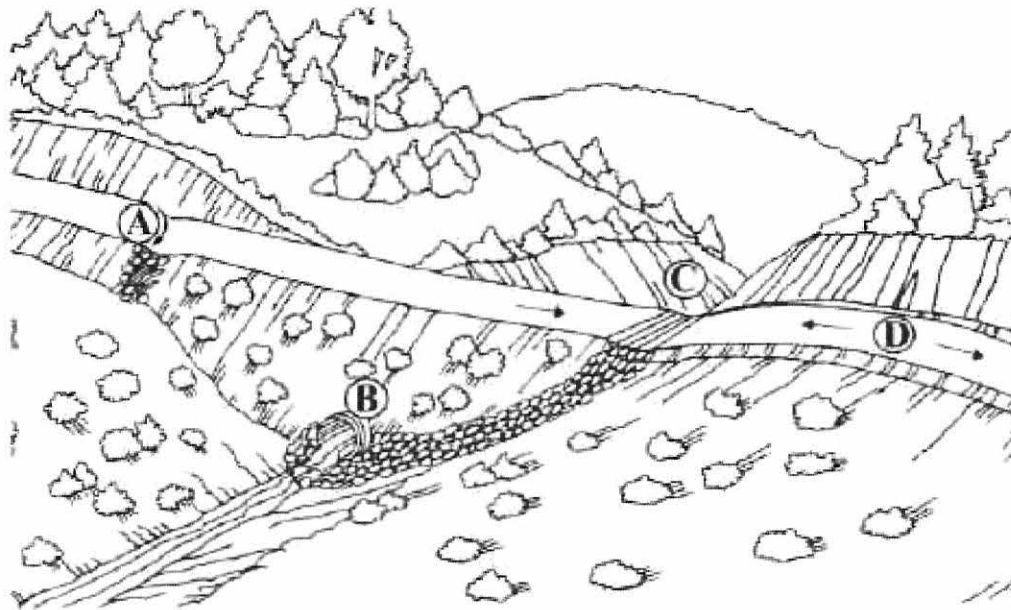
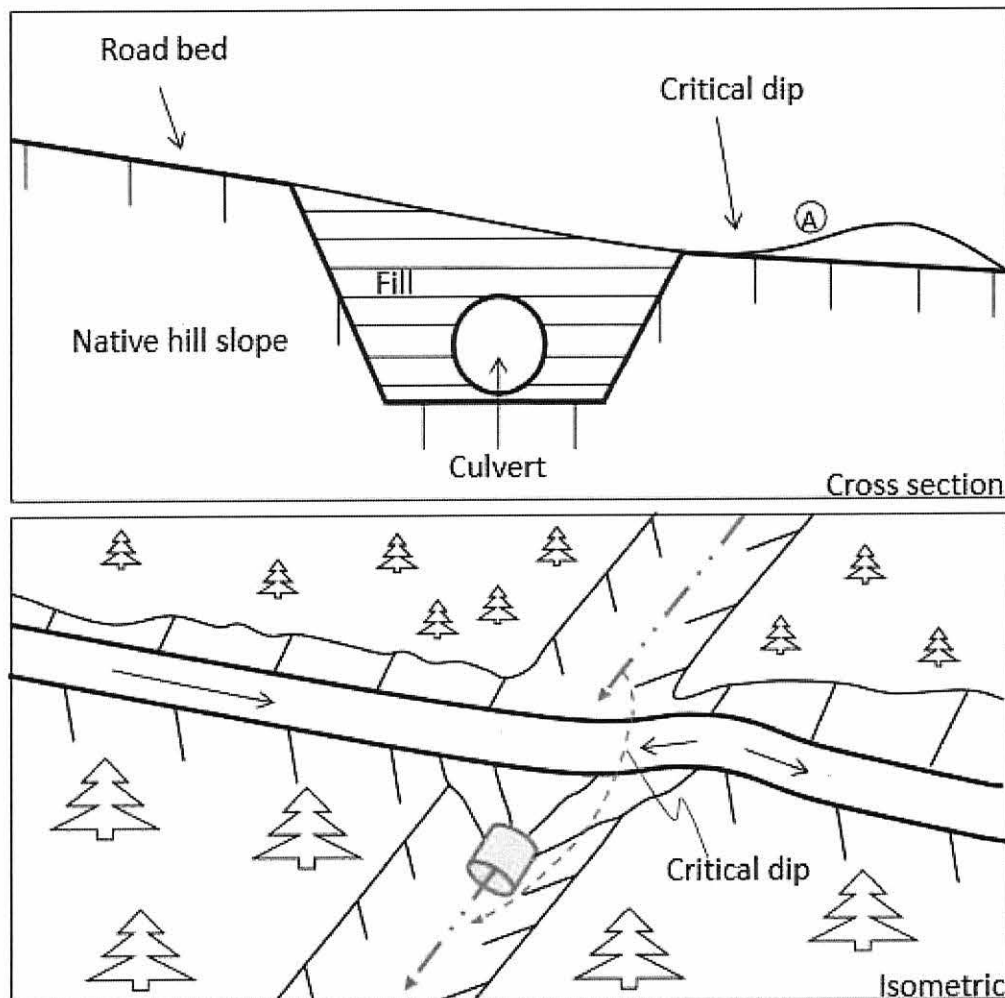


FIGURE 84. Critical dips or dipped crossing fills should be centered near a stream crossing's down-road hingeline, not over the centerline of the crossing where overtopping could cause washout or severe erosion of the fill. If the stream crossing culvert (B) plugs, water will pond behind the fill until reaching the critical dip or low point in the crossing (C) and flowing back down into the natural stream channel. The down-road ditch must be plugged to prevent streamflow from diverting down the ditch line. For extra protection in this sketch, riprap armor has been placed at the critical dip outfall and extending downslope to the stream channel. This is only required or suggested on stream crossings where the culvert is highly likely to plug and the crossing fill overtopped. The dip at the hinge line is usually sufficient to limit erosional damage during an overtopping event. Road surface and ditch runoff is disconnected from the stream crossing by installing a rolling dip and ditch relief culvert just up-road from the crossing (A) (Keller and Sherar, 2003).

BMP: Permanent Culvert Crossing Design (Critical Dip)

Typical Critical Dip Design for Stream Crossings with Diversion Potential



Critical Dip Construction:

1. Critical dip will be constructed on the lower side of crossing.
2. Critical dip will extend from the cutbank to the outside edge of the road surface. Be sure to fill inboard ditch, if present.
3. Critical dip will have a reverse grade (A) from cutbank to outside edge of road to ensure flow will not divert outside of crossing.
4. The rise in the reverse grade will be carried for about 10 to 20 feet and then return to original slope.
5. The transition from axis of bottom, through rising grade, to falling grade, will be in the road distance of at least 15 to 30 feet.
6. Critical dips are usually built perpendicular to the road surface to ensure that flow is directed back into the stream channel.

BMP: Permanent Culvert Crossing Design (Culvert Orientation)

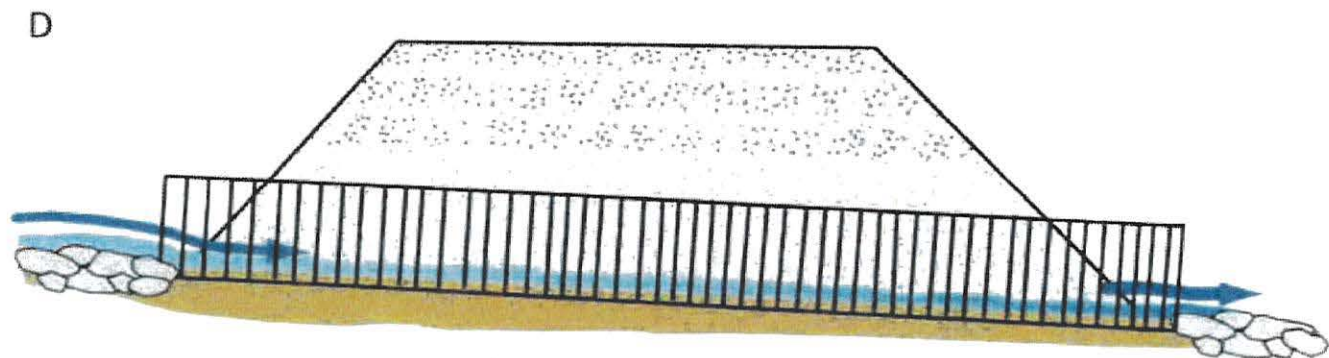
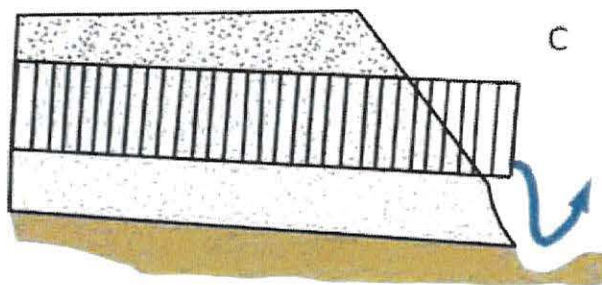
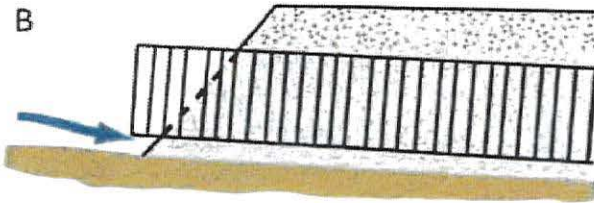
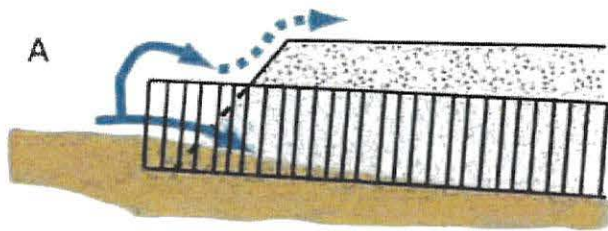
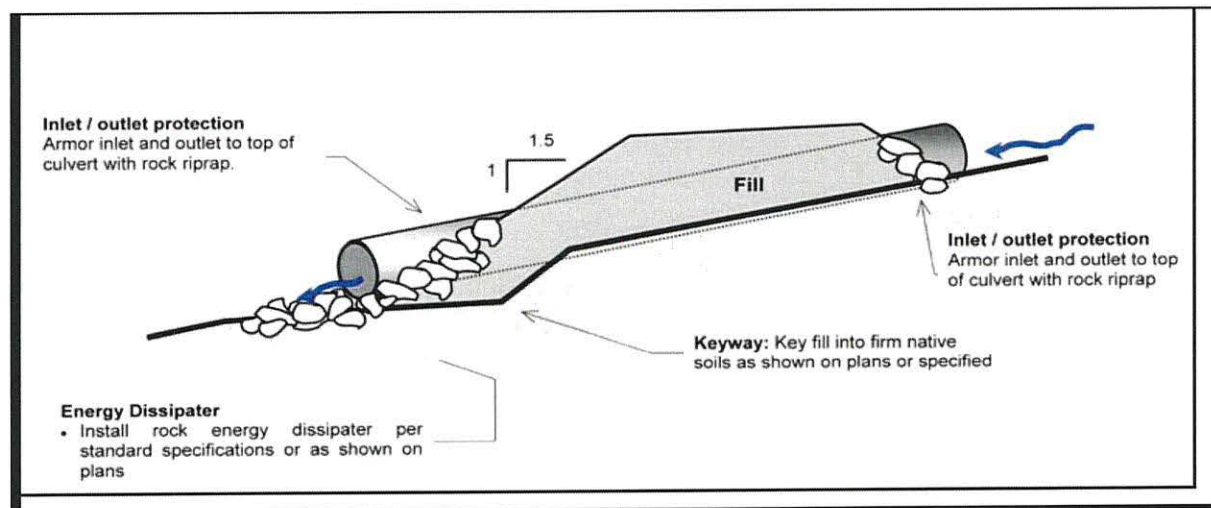
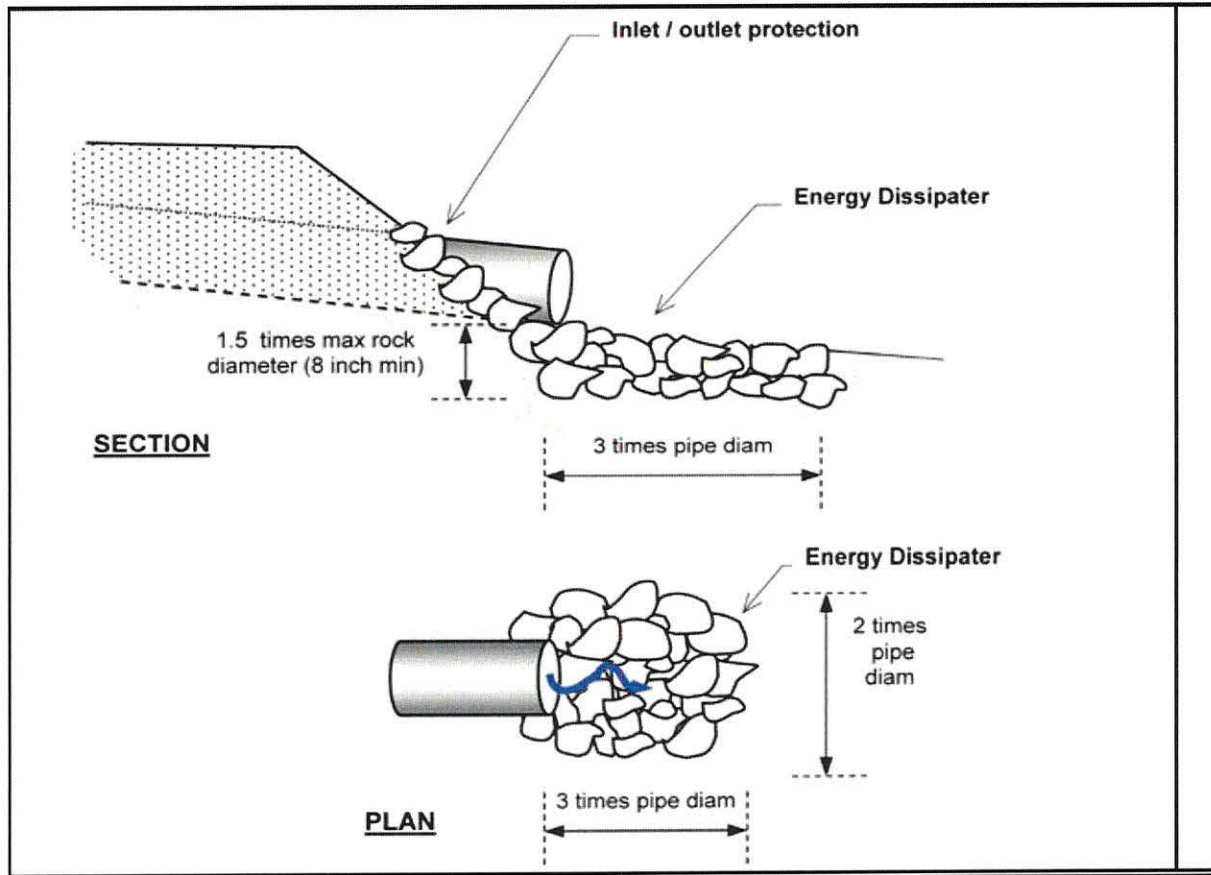


FIGURE 155. Proper culvert installation involves correct culvert orientation, setting the pipe slightly below the bed of the original stream, and backfilling and compacting the fill as it is placed over the culvert. Installing the inlet too low in the stream (A) can lead to culvert plugging, yet if set too high (B) flow can undercut the inlet. If the culvert is placed too high in the fill (C), flow at the outfall will erode the fill. Placed correctly (D), the culvert is set slightly below the original stream grade and protected with armor at the inlet and outlet. Culverts installed in fish-bearing stream channels must be inset into the streambed sufficiently (>25% embedded) to have a natural gravel bottom throughout the culvert (Modified from: MDSL, 1991).

BMP: Permanent Culvert Crossing Design (Inlet and Outlet Armoring)



Riprap installed to protect the inlet and outlet of a stream crossing culvert from erosion or for energy dissipation should be keyed into the natural channel bed and banks to an approximate depth of about 1.5x the maximum rock thickness. Riprap should be placed at least up to the top of the culvert at both the inlet and outlet to protect them from splash erosion and to trap any sediment eroded from a newly constructed fill slope above.

BMP: Permanent Culvert Crossing Design (Inlet and Outlet Armoring) Cont.

- Inlets of culverts and associate fills shall be protected with rock armoring that extends at least as high as the top of the culvert.
- Outlets of culverts shall be provided a rocked energy dissipater at the outfall of the culvert.
- Outlets of culverts and associate fills shall be protected with rock armoring that extends at least as high as the top of the culvert if road fill sloughing into channel can occur.
- Prior to inlet and outlet rocking, the inlet and outlets shall be prepared. Preparation will include removal of vegetation and stored materials from the inlet and outlet.
- Inlets may require construction of an inlet basin.
- Slopes at the outlet should be shaped to a 2:1 or natural slope prior to placing rock armor.
- Rock used at culvert inlets and outlets should be a matrix of various sized rocks and rip-rap that range from a 3" dia. to a 2' dia.
- The largest rocks should be places at the base of the culvert or fill. Incrementally smaller rocks shall be placed over the larger rocks at the armoring extend up the slope. Voids and spaces shall be back filled with smaller gravels and rocks.

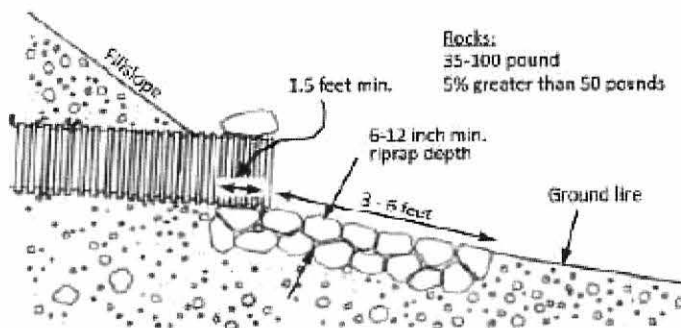


FIGURE 107A. Riprap armor at culvert outlet (Modified from: Keller et al., 2011).

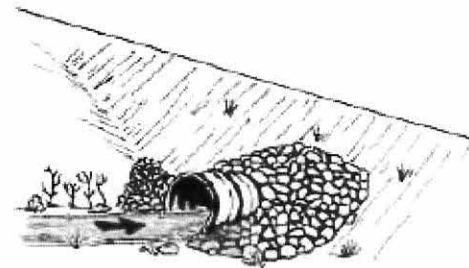


FIGURE 107B. Riprap armor at culvert inlet (Keller and Sheraz, 2003).

HANDBOOK FOR FOREST, RANCH AND RURAL ROADS

BMP: Stream Bank Armoring (Riprap)

- Riprap should be installed on top of geotextile fabric or a clean mixture of coarse gravel and sand.
- The riprap should be keyed into the streambed and extend below the maximum expected scour depth with an adequately sized key base width at a thickness of a minimum of 2x the median (D50) rock diameter with the largest stone sizes placed at the base of the riprap structure.
- The armor should be set into the streambank so it does not significantly protrude into, or constrict, the natural channel, or otherwise reduce channel capacity.
- The riprap should extend along the length of unstable or over steepened bank and up the bank sufficiently to encompass the existing bank instability and/or design flood elevations.

BMP: Crossing Abandonment

- Excavate and removing all fill materials placed in the stream channel when the crossing was originally built.
- Excavated banks shall be laid back to a 2:1 (50%) or natural slope to prevent slumping and soil movement.
- Fill material should be excavated to recreate the original channel grade (slope) and orientation.
- All bare soils should then be mulched, seeded, and planted to minimize erosion until vegetation can protect the soil surface.
- The approaching road segments shall be cross-road(waterbars) drained to prevent road runoff from discharging across the freshly excavated channel sideslopes.
- When fills are removed, they shall be excavated to form a channel that is as close as feasible to natural watercourse grade and orientation.
- The excavated channel bed should be as wide, or slightly wider than, the original watercourse channel.
 - This can be better determined by observing the channel width of the watercourse up slope of crossing to be removed at a point in which the crossing or any other disturbance has not affected the natural channel slope and width.
- Temporary crossings shall be removed by November 15.
 - Any temporary culvert crossing left in after October 15 or installed between October 15 and May 1, shall be sized to accommodate the estimated 100-year flow.
- In certain situations, bank and channel rock and woody debris armoring may be appropriate to provide channel and bank stabilization.

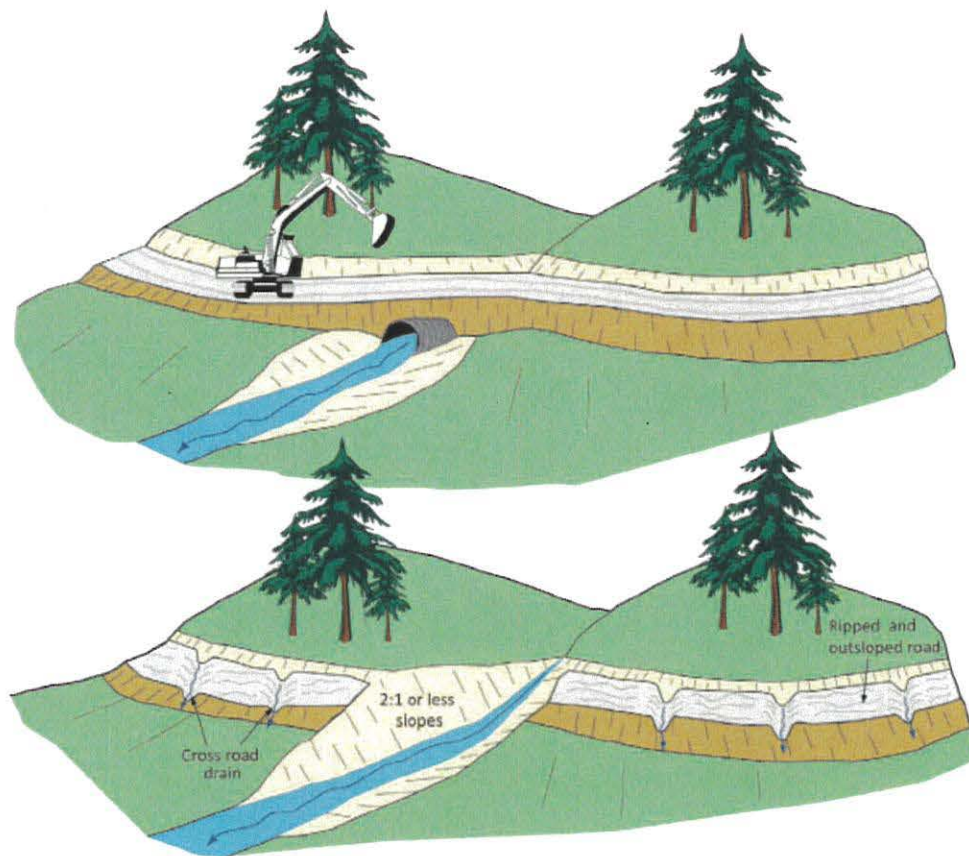


FIGURE 263. On roads that are to be closed (decommissioned), all stream crossing culverts and fills should be removed. Stream crossing excavations are best performed using an excavator. The original channel should be excavated and exhumed down to the former streambed, with a channel width equal or greater than the natural channel above and below the crossing. Sideslopes should be laid back to a stable angle, typically a 2:1 (50%) gradient, or less. Spoil can be endhauled off-site or stored on the road bench adjacent the crossing, provided it is placed and stabilized where it will not erode or fail and enter the stream.

BMP: Rolling Dip Design and Placement

- Rolling dips are drainage structures designed to force surface water to be drained from the road surface.
- The road shall dip into, and rise out of, the rolling dip to eliminate the potential of road surface runoff to run further down road way.
- The rolling dip shall be constructed with clean native materials or rock surfaced where specified.
- The rolling dips outlet may be armored to resist down-cutting and erosion of the outboard road fill.
- Do not discharge rolling dips into any areas that show signs of instability or active landsliding.
- If the rolling dip is designed to divert both road surface and ditch runoff, block the down-road ditch with compacted fill in order to force all ditch flows through the trough (low point) of the rolling dip.

BMP: Rocked Rolling Dip Design and Placement

- Rocked rolling dips are drainage structures designed to carry known sources of surface water across road ways or from known persistently wet segments of road such as swales without defined watercourses or road segments with heavy bank/road seepage.
- The road shall dip into, and rise out of, the rocked rolling dip to minimize diversion potential.
- The rocked rolling dip shall be constructed with clean rock that is large enough to remain in place during peak flows. Rock size shall vary relative to the anticipated flow through the dip with larger rock used in location where greater flow is anticipated.
- The rocked rolling dips inlet and outlet shall be armored to resist down-cutting and erosion.
- The entire width of the rocked rolling dip shall be rock armored to a minimum of 5-feet from the centerline of the dipped portion of the rolling dip.
- If a keyway is necessary, the rocked rolling dip keyway at the base of the dip shall be of sufficient size, depth and length to support materials used in the rocked rolling dip construction back up to the road crossing interface.
- Do not discharge rolling dips into any areas that show signs of instability or active landsliding.
- If the rolling dip is designed to divert both road surface and ditch runoff, block the down-road ditch with compacted fill.
- The rolling dip should be designed as a broad feature ranging from 10-100 feet long so that it is drivable by most types of vehicular traffic and not significantly inhibit traffic and road use.

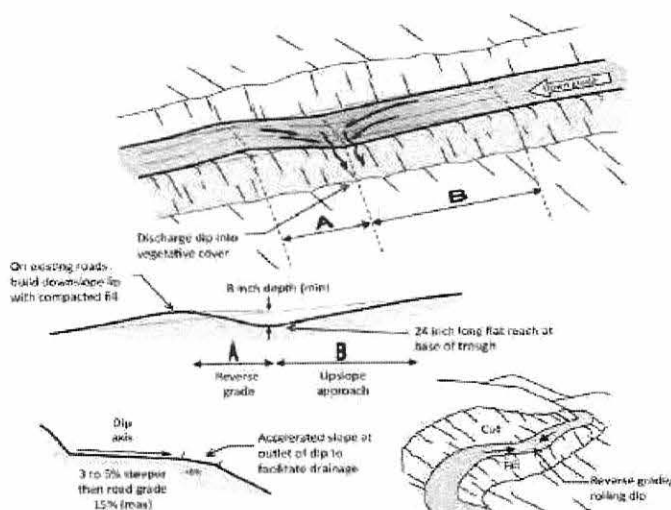
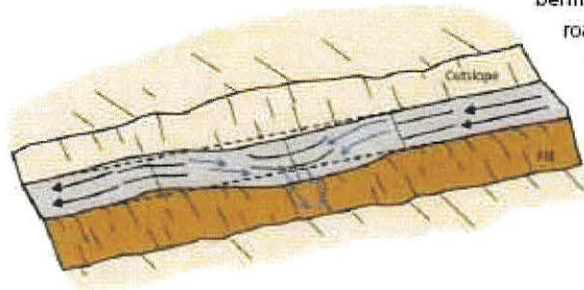


FIGURE 34. A classic Type I rolling dip, where the excavated up-road approach (B) to the rolling dip is several percent steeper than the approaching road and extends for 60 to 80 feet to the dip axis. The lower side of the structure reverses grade (A) over approximately 15 feet or more, and then falls down to rejoin the original road grade. The dip must be deep enough that it is not obliterated by normal grading, but not so deep that it is difficult to negotiate or a hazard to normal traffic. The outward cross-slope of the dip axis should be 3% to 5% greater than the up-road grade (B) so it will drain properly. The dip axis should be out-sloped sufficiently to be self-cleaning, without triggering excessive downcutting or sediment deposition in the dip axis (Modified from: Best, 2013).

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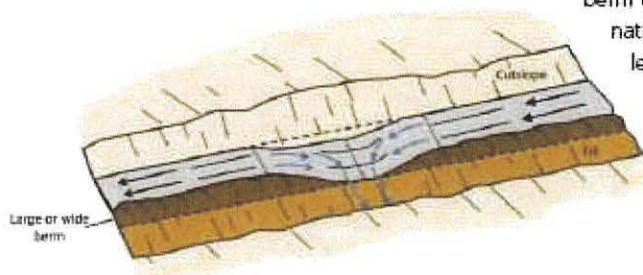
BMP: Rolling Dip Design and Placement (Types)

Type 1 Rolling Dip
(Standard)



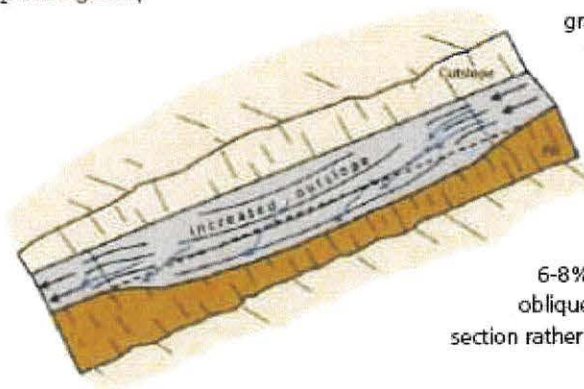
Type 1 rolling dips are used where road grades are less than about 12-14% and road runoff is not confined by a large through cut or berm. The axis of the dip should be perpendicular to the road alignment and sloped at 3-4% across the road tread. Steep roads will have longer and more abrupt dip dimensions to develop reverse grade through the dip axis. The road tread and/or the dip outlet can be rocked to protect against erosion, if needed.

Type 2 Rolling Dip
(Through-cut or thick berm road reaches)



Type 2 rolling dips are constructed on roads up to 12-14% grade where there is a through cut up to 3 feet tall, or a wide or tall berm that otherwise blocks road drainage. The berm or native through cut material should be removed for the length of the dip, or at least through the axis of the dip, to the extent needed to provide for uninterrupted drainage onto the adjacent slope. The berm and slope material can be excavated and endhauled, or the material can be sidecast onto native slopes up to 45%, provided it will not enter a stream.

Type 3 Rolling Dip
(Steep road grade)



Type 3 rolling dips are utilized where road grades are steeper than about 12% and it is not feasible to develop a reverse grade that will also allow passage of the design vehicle (steep road grades require more abrupt grade reversals that some vehicles may not be able to traverse without bottoming out).

Instead of relying on the dip's grade reversal to turn runoff off the roadbed, the road is built with an exaggerated outslope of 6-8% across the dip axis. Road runoff is deflected obliquely across the dip axis and is shed off the outsloped section rather than continuing down the steep road grade.

FIGURE 36. Rolling dip types

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BMP: Rolling Dip Design and Placement

FIGURE 33A. Rolling dip constructed on a rock surfaced rural road. The rolling dip represents a change-in-grade along the road alignment and acts to discharge water that has collected on, or is flowing down, the road surface. This road was recently converted from a high maintenance, insloped, ditched road to a low maintenance, outsloped road with rolling dips.



FIGURE 33B. This side view of an outsloped road shows that the rolling dip does not have to be deep or abrupt to reverse road grade and effectively drain the road surface. This outsloped forest road has rolling dips that allow all traffic types to travel the route without changing speed.



BMP: Waterbar/Rolling Dip Combined with DRC



FIGURE 39.

Waterbars are often used to drain surface runoff from seasonal, unsurfaced roads. Because they are easily broken down by vehicles, waterbars are only used on unsurfaced roads where there is little or no wet weather traffic. In this photo, a waterbar and ditch relief culvert are used to drain all road surface and ditch runoff from the insloped road prism.

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Diagram shows and discussed the use of a waterbar. However, a DRC combined with a rolling dip structure provides the same surface and ditch drainage for roads used year-round. Just as with the waterbar in the photo above, The DRC is installed just upslope from the rolling dip. This also creates a fail-safe should the DRC become plugged or overwhelmed.



FIGURE 238. *Traffic and surface runoff from graveled roads often produces surface erosion, turbid runoff and fine sediment transport that can be delivered to streams. Where ditches can't be eliminated, sediment traps and roadside settling basins can be installed to capture and remove most of the eroded sediment. This settling basin has been constructed along the inside ditch just before a stream crossing culvert inlet (see arrow). Eroded sediment from the road and ditch are deposited in the basin before flow is released to the stream. Fine sediments have filled about 1/3 of this basin and vegetation is now growing. Sediment basins require periodic maintenance to maintain their storage capacity.*

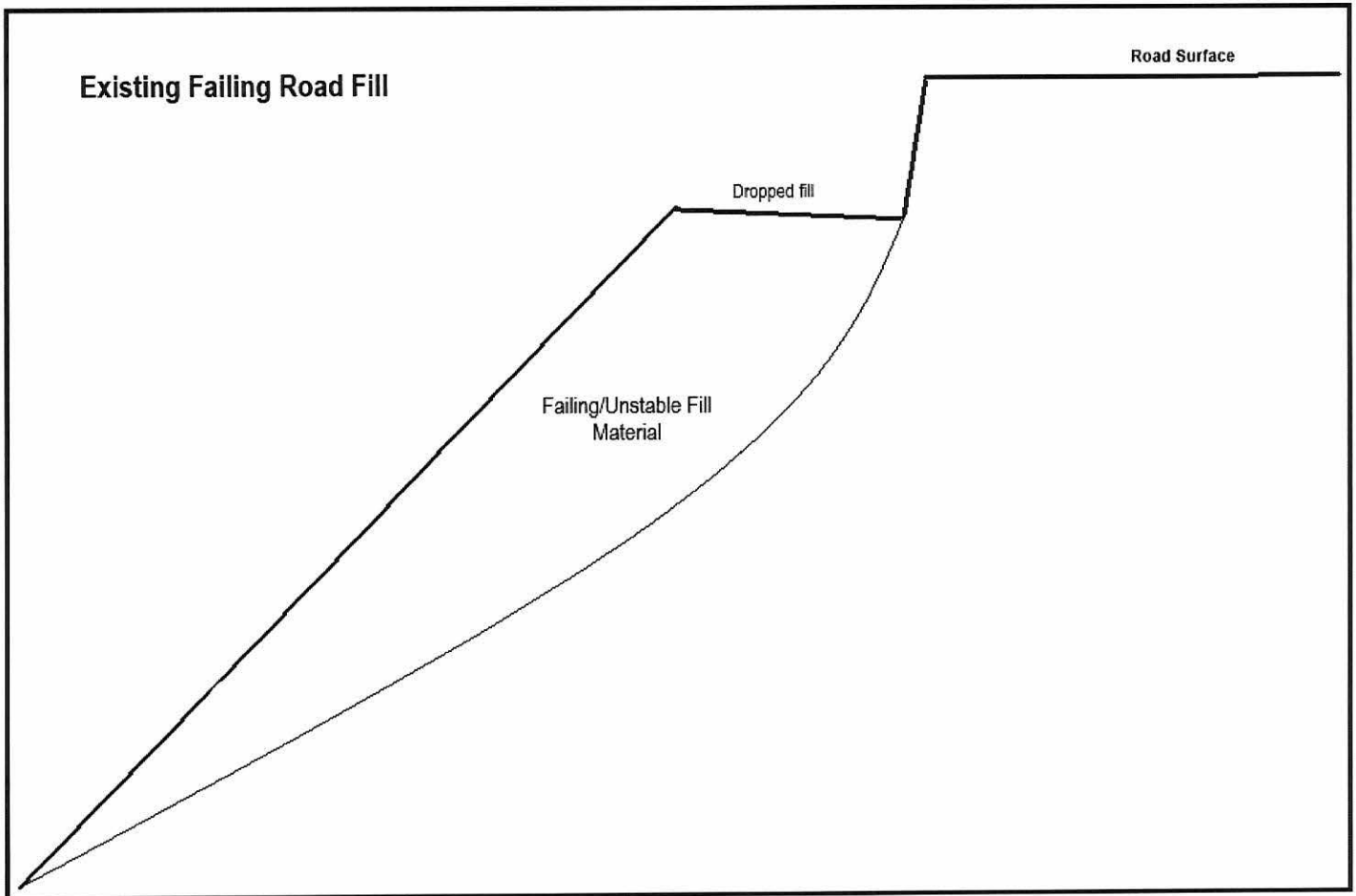
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BMP: Unstable Fill Removal and Treatment

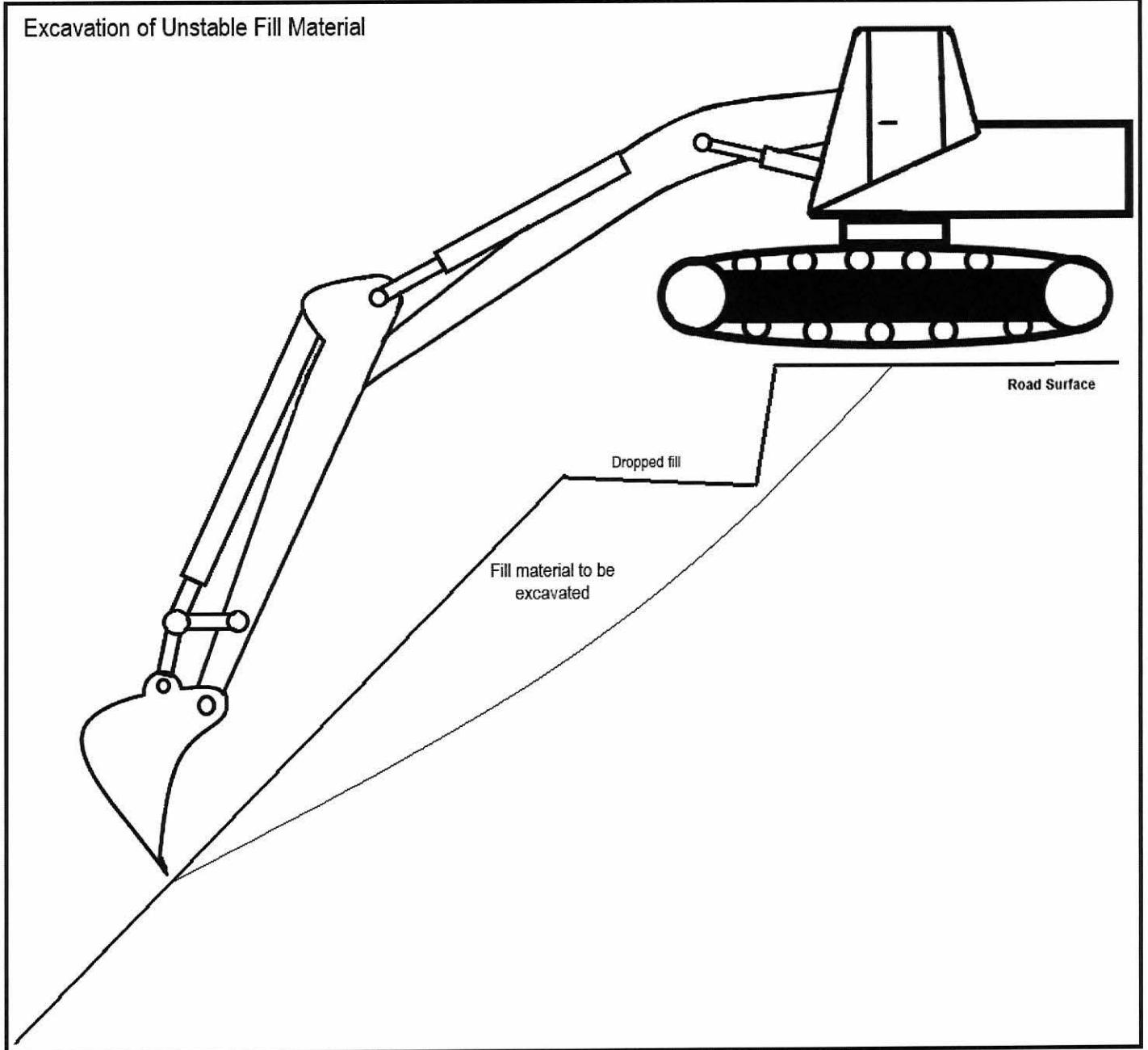


FIGURE 230. *The most cost-effective treatment for unstable fills along the outside of a forest, ranch or rural road is simply the direct excavation of the unstable material. If road width is too narrow, additional width can often be derived from cutting into the bank. The excavation should encompass the unstable fill materials, beginning at the inside crack or scarp, and extending out and down the fill slope as far as possible. For proper surface drainage, and to retrieve most of the unstable fill, the excavation should have a concave profile when completed. Typically, the bulk of the fill is within 20 to 25 feet of the outside edge of the road and is easily reached by a midsized excavator. Any remaining fill is likely to be small enough that it will not fail or travel far enough to reach the stream.*

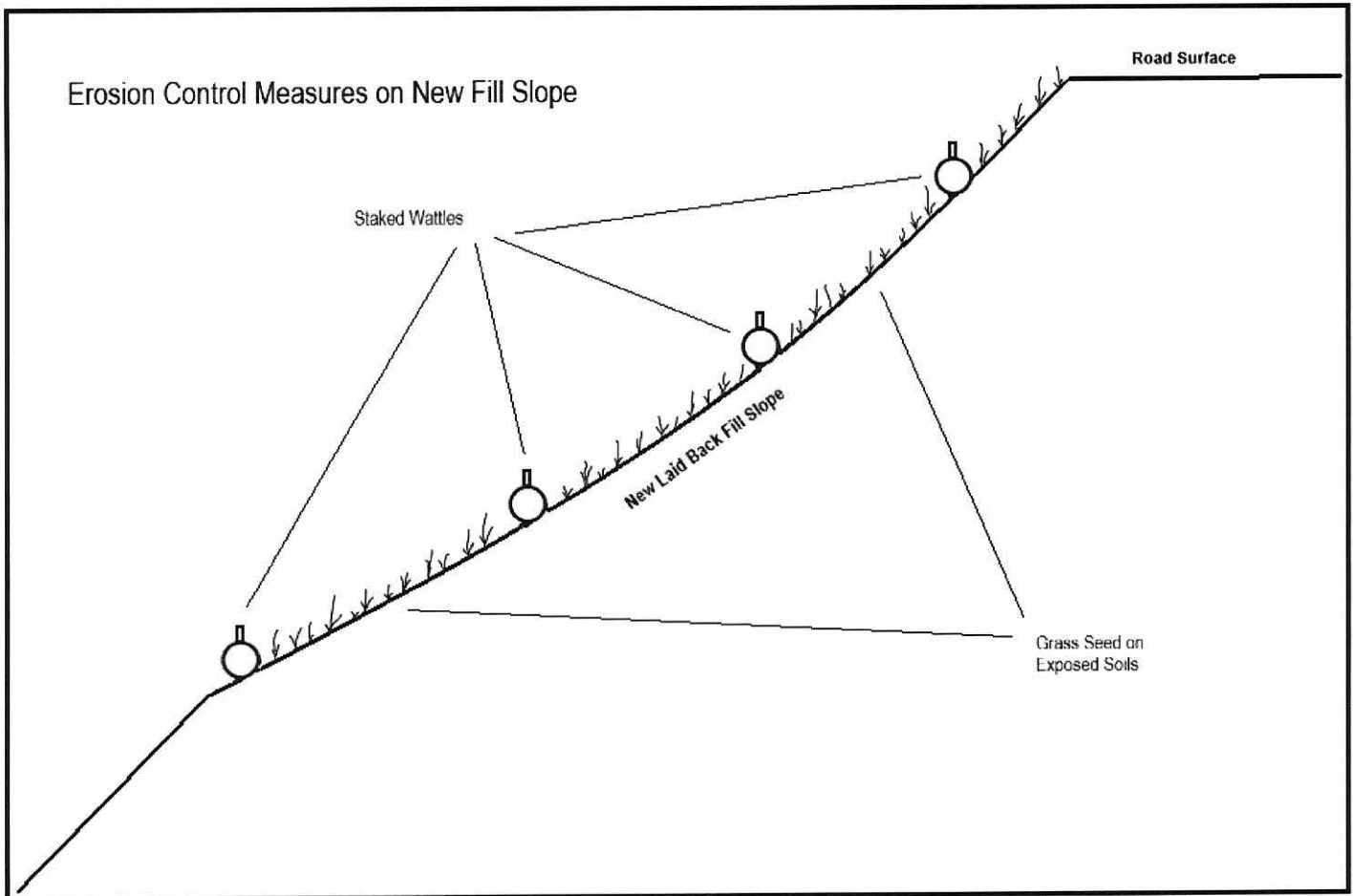
BMP: Unstable Fill Removal and Treatment



BMP: Unstable Fill Removal and Treatment



BMP: Unstable Fill Removal and Treatment



BMP: Rock Armor Cutbank

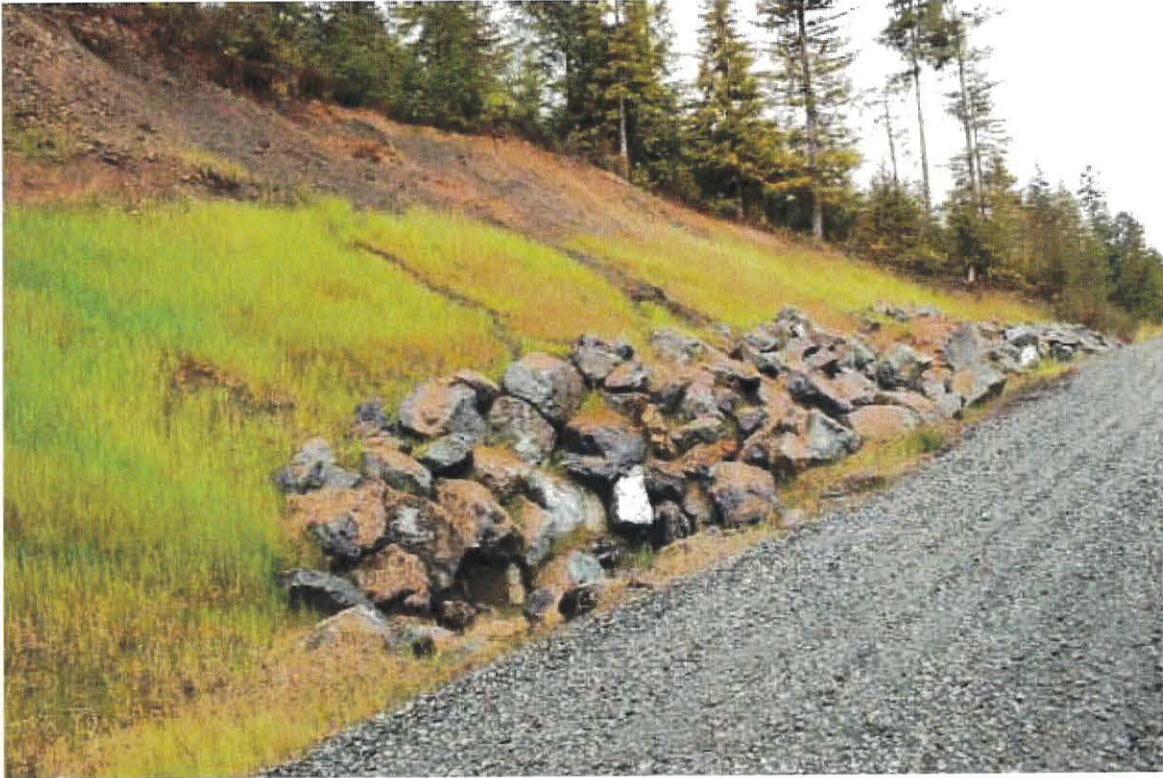


FIGURE 52. This wet and potentially unstable cut slope on a newly constructed road was stabilized using a buttress of large rock armor. To assure their effectiveness, rock buttresses and other retaining structures should be designed by a qualified engineer or engineering geologist.

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BMP: Rip-Rap Size Class Table

TABLE 25. Standard classification and gradation of riprap by size of rock¹

Riprap size class	Median particle weight ²	Median particle diameter ² (in)	Minimum and maximum allowable particle size (in) ²							
			D ₁₅		D ₅₀		D ₈₅		D ₁₀₀	
			Min	Max	Min	Max	Min	Max	Max	
Class I	20 lb	6	3.7	5.2	5.7	6.9	7.8	9.2	12.0	
Class II	60 lb	9	5.5	7.8	8.5	10.5	11.5	14.0	18.0	
Class III	150 lb	12	7.3	10.5	11.5	14.0	15.5	18.5	24.0	
Class IV	300 lb	15	9.2	13.0	14.5	17.5	19.5	23.0	30.0	
Class V	¼ ton	18	11.0	15.5	17.0	20.5	23.5	27.5	36.0	
Class VI	3/8 ton	21	13.0	18.5	20.0	24.0	27.5	32.5	42.0	
Class VII	½ ton	24	14.5	21.0	23.0	27.5	31.0	37.0	48.0	
Class VIII	1 ton	30	18.5	26.0	28.5	34.5	39.0	46.0	60.0	
Class IX	2 ton	36	22.0	31.5	34.0	41.5	47.0	55.5	72.0	
Class X	3 ton	42	25.5	36.5	40.0	48.5	54.5	64.5	84.0	

¹Lagasse et al. (2006)

²Equivalent to spherical diameter

BMP: Generator, Fuel, and Oil Management (General Requirements and Used Oil and Oil Filters)

All bulk fuel storage or petroleum products, any/all future petroleum products and other liquid chemicals, including but not limited to diesel, biodiesel, gasoline, and oils shall be stored so as to prevent their spillage, discharge, or seepage into receiving waters. Storage tanks and containers shall be of suitable material and construction to be compatible with the substance(s) stored and conditions of storage such as pressure and temperature. Above ground storage tanks and containers shall be provided with a secondary means of containment for the entire capacity of the largest single container and sufficient cover shall be provided to prevent any/all precipitation from entering said secondary containment vessel.

If the volume of a fuel container is greater than 1,320 gallons, a Spill Prevention, Control, and Countermeasures (SPCC) plan will be required for the use the fuel tank.

On-site storage of petroleum products, or other fuels used for commercial activities may require registration as hazardous materials through the California Environmental Reporting System (CERS). Additionally, the waste oil generated from commercial activities (generators) and their used oil filters are considered hazardous waste and requires addition reporting. The discharger is advised to contact local agencies to find out if such reporting is applicable to currently operations

Used motor oil is required to be stored in sealed containers that the oil was originally packaged in, e.g. sealed buckets/quart or gallon jugs, or other sealed containers designed to store motor oil. Stored used oil is required to be regularly disposed of at hazardous waste disposal sites. Used oil filters are also required to be stored in sealed containers, e.g. sealed plastic totes/buckets, for later disposal at a hazardous waste disposal site. These storage containers are required to be stored in structures where they are protected from precipitation.

Further information regarding the State of California's requirements for the managing of Used Oil and Oil Filters can be found by entering the links below or searching the corresponding titles to the links.

California Department of Toxic Substances Control - Used Oil Generator Requirements

- <https://www.dtsc.ca.gov/InformationResources/upload/RAG-UsedOilforGenerators.pdf>

Department of Toxic Substances Control - Managing Used Oil Filters for Generator

- https://www.dtsc.ca.gov/InformationResources/upload/RAG_Used-Oil-Filters_Generators1.pdf

BMP: Generator, Fuel, and Oil Management (Generators and Pumps)

All generators and petroleum powered pumps are required to have spill trays or secondary containment placed underneath them when using, fueling, or changing oil on them to prevent the potential for leeching, seepage or spillage of petroleum products. All spill trays and containment structures require cover from precipitation. All generators and petroleum powered pump locations are also required to have spill cleanup kits on hand.

Pre-fabricated secondary containment structures and spill trays can be purchased online or from local wholesalers of petroleum products. As an alternative to pre-fabricated secondary containment structures, structures can be constructed from wooden, cinderblock, concrete, or metal frames lined with PVC liners, e.g. pond liner/water bladder material, as long as the containment is fully sealed and constructed in a similar manner to examples of pre-fabricated containment structures found below. Ensure that diked areas are sufficiently impervious to contain discharged chemicals. All containment structures require cover from precipitation to prevent the containment from filling with water. Secondary containment for fuel tanks shall not be constructed.

As an alternative to pre-fabricated spill kits, kits can consist of sealed trashcans or buckets with industrial absorbent material (e.g. cat litter) and shovels, placed nearby any location where generators, pumps, or other petroleum products or chemicals are used.

Examples of industry standard pre-fabricated spill containment and clean-up kits can be found following or entering the links below. Pre-fabricated spill containment and clean-up kits can be purchased online, from Renner Petroleum, or other similar industry providers.

Ultratech Spill Containment

- <http://www.spillcontainment.com/categories/spill-containment/>

New Pig Portable and Collapsible Spill Containment

- <https://www.newpig.com/collapsible-berms/c/5142?show=All>

BMP: Generator, Fuel, and Oil Management



Example of a small, portable, and compact containment berm.



Example of a portable utility spill tray.

BMP: Generator, Fuel, and Oil Management



Example of secondary containment for a fuel tank. This container requires cover from precipitation.



Example of spill pallets for unused or used oil drums and other petroleum products.